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Lines, Lines, Lines

35,000 Attend Fall Joint Computer Conference

By Edward J. Brinde
on staff wires

LAS VEGAS The 1979 Fall Joint Computer Conference has come and gone, although some 35,000 of the best estimated travelers may still be having nightmares about taxis, planes, and phones.

The conference appeared most successful from the viewpoint of the "average" visitor. The booths seemed bigger, more colorful and certainly better organized than before. Company representatives, male and female, were well-briefed, and most exhibitors appeared happy with the general set-up.

That is, until you start talking about transportation on telephones. Getting to Las Vegas was often difficult, but finding an available taxi was a major effort. And finding a phone which would produce something other than a busy signal before you were finished dialing was

next to impossible.

Waiting in line was fashionable, but you could choose between phone lines, cafeteria lines, taxi lines, and, if you really wanted a line, you could get in a registration line. If you dozed long enough, you could try catching in some clips at any of the casinos there usually weren't many people waiting there.

Getting out of town was something else again. Airlines had to schedule extra flights, and buses had to make extra trips to Boulder City, Arizona, where the "spillover" visitors were berthed in hotels, motels, and private homes. But most of the conferees left feeling that these problems, significant as they were, could be expected any time thousands of people swarm over a town of this size. Local papers quoted an official of the American Federation of Information Processing Societies (AFIPS) conference sponsor, as

expecting 15,000 to 20,000 to attend the semi-annual computer gathering. AFIPS final estimates weren't available, but about twice the quoted figure seemed closer to the actual number.

The number of attendees was less than the spring session in Boston, but this was no surprise since Las Vegas does not draw "walk-in" visitors from any metropolitan area. In this case, it was fortunate, because it left more room to walk, think, and occasionally sit.

170 New Exhibitors

The number of exhibitors set a new record. About twice the number at the spring conference according to AFIPS. Almost half of the exhibitors, 170, were said to be making their conference debut here, and there were almost as many new products.

As expected, minicomputers dominated the new products part of the show, along with data entry devices. A different approach also was prominent: hardware styling. From minicomputers to large mainframes, colors, paneling, and new external designs prevailed even when there wasn't the slightest change inside.

A mild battle took place between the "mimik" and the time sharing outfits, as both competed for the attention and funds of the small user.

Among the unique ideas and original approaches to various problems was Control Data's booth, which avoided some cost (and the unavailability of floor space) by constructing a "two-story" exhibit.

The Las Vegas Convention Center had proved inadequate and the conference was held "officially" in two locations. About one-third of the exhibitors, or in about 20% of the floor space, were set up in the Sahara Hotel, with a free shuttle bus periodically transporting visitors to and from the two centers, somewhat reducing the inconvenience. This arrangement was more successful than some had anticipated, and was but another indication of the rampant growth of the joint conferences.

Plaudits for Panels

The panel discussions basically performed their stated function, although they probably could have done so in less time. The members all possessed formidable credentials, were well-prepared, and, for the most part, did a commendable job of fielding questions from the floor.

As often happens, the sessions were prolonged by some few (Continued on Page 2)



Barker at the Worldwide Computer Services booth uses Las Vegas techniques to attract visitors.

Consent Decrees Deleted By Antitrust Suit Judge

ST. PAUL, Minn. All references to the 1935 and 1956 consent decrees signed by IBM have been ordered stricken from the complaints of the four computer companies involved in the antitrust suit against IBM.

But Federal Judge Philip Neville, noting that this ruling may involve a "substantial ground for difference of opinion," opened the door to an immediate appeal by the plaintiffs.

Each of the complaints against IBM by Control Data Corp., Data Processing Equipment and General Corp., Applied Data Research, Inc., and Programmatic, Inc., mentioned one or both of the consent decrees. The four cases were consolidated in U.S. District Court here July 31.

In granting IBM's motion, the

judge noted that the plaintiffs were not parties to the decrees and in fact didn't even exist at the time they were signed.

"It seems to the court that if IBM's practices within the period of the statute of limitations are or have been monopolistic and/or violative of the Sherman Act or other laws, they should stand on their own feet and be capable of proof as such," the judge stated.

"If they are not independently unlawful and provable, then the fact that they are contrary to a consent decree entered some 13 years earlier cannot make them so," he said.

In the same 20-page ruling, Judge Neville denied a motion by IBM to have certain other charges stricken from ADR's complaint.

ADR has charged that IBM has "intentionally and deceptively developed, fostered, and maintained a viewpoint among computer users that computer software is an intangible without market or property value," that IBM has committed a fraud on the Patent Office in applying for and obtaining patents, and that IBM has advocated a view in the Patent Office that software is not patentable subject matter.

IBM contended that these charges attacked its right to enforce public officials.

Judge Neville set Jan. 12 for the next court hearing.

Terminals, Minicomputers Dominate FJCC Exhibits

By Peter L. Briggs
on staff wires

LAS VEGAS The leaders at this year's Fall Joint Computer Conference were definitely terminals, minicomputers, and mass storage devices.

Technical paper presentations were somewhat improved over last year, but still poor.

At least 100 of the 368 exhibitors demonstrated their terminals. Terminals are now available in several decorator colors, with wood-grained vinyl as the deluxe look.

Color (displays), speed (printers), and versatility (data stations) were the prime claims this year.

Vision demonstrated several of its units, and IBM showed off its new 2770 and 2790 communications stations.

Data Speed Page

AT&T demonstrated its new magnetic tape unit and cartridge that can be used with any Teletype to replace the paper tape station.

The unit operates through the

company's Datasep service, at 2,400 words/min. Storage capacity for this cartridge is 150,000 characters.

No attempt, the company says, was made to make the cartridge system computer-compatible. Recording is incremental, with file searching capabilities similar to those available with the IBM magnetic tape to selective typewriter system.

Minicomputers

Perhaps 20 new minicomputers were introduced this fall. Newer, smaller, more versatile, and cheaper than all their competitors and predecessors, according to their respective companies, these computers do seem to offer more useful abilities than ever before.

More I/O capability with much better software is creating strong interest in these newer machines, according to several people here. Peripherals for these machines abound. Printers, tape drives, disks, drums, and console entry devices that can be used, the companies say, with all new (Continued on Page 2)

On the Inside

Exclusive Photo Tour
Of the Fall Conference

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IBM Seen Competing
For Services Market

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Unicon 680 laser mass memory attracts crowds to Precision Instrument Co. booth.

Terminals, Minicomputers Dominate FJCC Exhibits

(Continued from Page 1)
minicomputers are being introduced by the dozen.

New Bulk Memories

Precision Instruments demonstrated its long-discussed Unicon laser-memory system for a trillion bits of usable data, the Unicon, even without its error correction circuitry, achieved an error rate of only 1 bit in 100 million, according to Dr. Konrad Schobel, company president.

Initial delivery of the unit, to Pan American Petroleum Corp. in San Francisco, is scheduled for the second quarter of next year, he said.

In discussing plans for the unit with CW, Schobel said that the company has already begun working on the software to interface the unit with Illiac IV (the giant Burroughs system being developed by the University of Illinois).

Lockheed demonstrated its new memory system, an ex-

tended core memory for Univac and S/360 computers.

Ampex's new magnetic tape strip memory was displayed for the first time. The unit allows high-density data storage and retrieval through a company-developed technique.

Technical Sessions

The technical sessions were very slightly improved from those given last spring. In spite of Alfip's efforts to offer training for speakers during the ACM show in San Francisco last summer, the lack of competent speakers was obvious to everyone. Many speakers were unable to communicate any interest to the majority of their listeners, creating boredom and annoyance among many of the 35,000 to 45,000 attendees.

The session schedule created somewhat less than the usual number of conflicts, with semi-technical and general interest sessions held concurrently with purely technical sessions.

35,000 Jam Fall Joint Conference, Creating Transportation Problems

(Continued from Page 1)
questions of less than general interest, and moderators were slow to stop any irrelevance. And the panel on computer-related social problems did little more than define its title; it reshaped well-known problems, but had no solutions short of the terse "let's everybody get concerned."

Among the problems raised were security and the misuse of the "inevitable" national data bank, computer technology which was said to be advancing faster than the people whom it serves, and discrimination against Negroes and women in the data processing industry. Some personal ideas also prevailed, such as pacifism ("A computer is at the heart of every military system"), but few solutions were offered.

The technical sessions were generally well-received. Fewer "poor" papers were presented.

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than in the past. The FJCC had its problems, however, the logistics improved; discussions were colorful and more interesting, and exhibits were better than ever.

ACM Financial Position Now Improving

LAS VEGAS—The financial position of the Association for Computing Machinery is improving, it was reported at the first session of the ACM Council. In reporting the current financial picture and expectations for the next few months, George Glaser, council treasurer, said that the ACM position had been improved by about \$43,000 since last June.

Current bills are being met by available cash, partly through early payments on January receipts, he said. He explained that the amount of early cash received would not interfere with payment of January bills out of January cash while it did by about \$40,000.

The current total deficit, including services that have been paid for but are not due to be

Education Committee Proposes Topics for Follow-Up DP Course

LAS VEGAS—Before an audience of about 60, the FJCC Education Committee presented a 17-point list of topics suggested for a second, or follow-up, course in computing.

The proposed course is itself a follow-up to the committee's 1968 recommendations for a survey course aimed at those who don't intend to become computer professionals.

The topics for the second course were designed for the college student who is committed to a discipline other than computing, who has taken an introductory course, and who wants to explore the field further.

The committee, chaired by Prof. Fred Gruenberger, San Fernando Valley State College, listed the following for inclusion:

1. A survey of the book and serial literature of the field, of the immediately preceding two years or so.
2. A term project. "If we subscribe to the notion that computing is learned only by doing, it is then time to insist that the student carry through at least one nontrivial computing task by himself, and document it. He should learn that there is a difference between program documentation and problem documentation."

3. The concept of cost-effectiveness should permeate the entire second course.

4. The material that should have been covered in the first course may not have been, but if it was, it should now be reviewed and some of it should be explored in greater depth.

5. Survey of the types of computer languages, their status, uses, and limitations.

6. Recognition of what constitutes a good computer problem, how to judge the size and complexity of a problem, the tools available to solve it.

7. Orientation toward other disciplines, for motivation and to broaden the range of applications.

8. Business data processing: file structure, file manipulation, and business problems.

9. Familiarity with proprietary and packaged programs, but

with due warning of the constraints and limitations imposed by the use of packaged programs.

10. Topics in nonnumerical information processing and artificial intelligence.

11. Online computing; interactive computing; conversational computing; remote job entry; graphics.

12. Operating systems—not in great depth.

13. It is suggested that the second survey course be accompanied by a course given in the discipline of the student in his own department.

14. Hardware and software selection—the questions should be taught what students to ask in this process.

15. A survey of the societies active in the field.

16. What to do until the computer expert arrives. "How to recognize a lie."

17. Above all, the stress is on fostering good computing, discouraging bad computing, and knowing how to tell one from the other.

The panelists, often representing a broad spectrum of opinion, fielded inquiries about the relative merits of hands-on experience, the absence of programming instruction in the course,

and the lack of emphasis on hardware components.

The lack of a topic covering the impact of computers on the future was raised by two members of the audience. In response, one panel member answered, "You want to teach them computing, and they'll develop the future. I think it is presumptuous of any of us to talk about the future with computers. I rather object to having them in the course myself."

Discussion was somewhat hindered because the room was equipped to accommodate about 1,100 people, and floor microphones were rarely used, so that the audience was sometimes unfamiliar with the question being answered.

In addition to Gruenberger, the committee included Richard Anderson, professor, University of Michigan; William Atchison, professor, University of Maryland; Charles Culver, Automation Institute, Long Beach, Calif.; Don Korbish, Santa Monica Community College; Roger Mills, TRW Systems, Inc.; George Town, associate professor, Seattle University; Roger Vance, with professor, University of Arizona; and Robert White, Informatics, Inc.

Rigging Votomatic System Said 'Virtually Impossible'

LOS ANGELES—While it theoretically would be possible to rig the counting of votes on ballots under the IBM Votomatic system, security measures, testing procedures, and the complexity of the system make rigging "virtually impossible," an IBM expert told the Los Angeles County Elections Security Committee.

The committee, created to investigate charges that the system could be rigged, has heard other witnesses call for suspension of the system's use [CW, Nov. 19].

The IBM expert, William Kanaga, said that the system would have to be tampered with in one of two areas, during the card to tape phase or during the compilation run.

lookup had never received any attention.

"When all these things were new, and being discovered for the first time, no one was around to codify this information. With the speed of the industry's change, no one has ever gotten around to writing it down, or organizing it anywhere. Most of the programmers around today are working in the 'cellar' of data processing, when compared with the intellectual heights of information theory and complex system design. They have never had anyone to teach them these things," Oegerger said.

"Programming science, as a subject, should not be restricted to that work being done at the forefront of technology. It must include all the techniques needed for programming."

Since the card to tape phase is handled, as many as 27 different kinds of readers, and since each of the 27 system is tested before and after the run, he doubted that if work is done to rig the election without detection. Since it is unknown in advance how many cards each system will read, it would be impossible to know in advance at what point a program alteration should be terminated to escape detection by post-testing, he said.

The compilation system is resident on a disk pack kept under lock and key in the office of the registrar of voters, Kanaga said. It is tested for up to 30 days before the election, so any alteration would have to be made between the time of the last card and election night, he said.

After the semi-official tally is completed election night, the system is tested during the 30 days to update the results, he said. Any rigging of the count also would be likely to be detected at that time, he stated.

Since the original punch card ballots are kept, they can be audited at any time as a further check, he said.

The state guarantee of the integrity and security of the election, of course, rests in the integrity of the registrar of voters and his staff, and in the security measures that have been imposed upon the conduct of the election," Kanaga said.

He said that if he were asked to rig an election in Los Angeles County, "I would have to tell you it would be virtually impossible for me to do it."

hard to ignore



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Terminal Enters Basic 4 Commands From One Key

Interplex In-House T/S Terminal

LAS VEGAS—A terminal specifically designed for use with Basic, and integrated with a new in-house time-sharing system was announced by Interplex Corp.

The terminal keyboard offers what appears to be the unique capability of entering Basic 4 commands from appropriate function keys. This eliminates much typing and makes it possible for the terminal to operate with only a strip printer, instead of the usual 80-character printer, the company says.

Functions such as LET, LIST, SIN, END, and GOTO are all directly entered by depressing one key. The center section of the keyboard contains the alpha-

betic characters.

Some interested users at FJCC commented that they found the whole idea of a specialized keyboard very attractive. The only limitation seemed to be the limited width for printouts.

Printing is formatted to fit a strip printer, with specialized format control keys to select the type of display.

A full 16-terminal system with software, the company says, can be leased for about \$1,800 per month. Initial deliveries are scheduled for next spring.

Interplex is located at 400 Totten Pond Rd., Waltham, Mass.

Infoton Announces New Terminal CRT Displays

LAS VEGAS—Priced about 50% lower than comparable terminal displays, the KDT series of CRT terminals was introduced by Infoton.

The KDT-1 is available in four models ranging in price from \$1,495 to \$2,995. The four models of the KDT-2 are priced from \$1,995 to \$2,995.

The KDT-1 is designed as a substitute for teletypewriters. The KDT-2 is designed primarily as a data entry terminal, and has

a full range of editing capabilities. These include insertion and deletion of characters and lines, format protection, and tab features.

These units interface to standard dataphone sets of up to 2,400 baud. Higher speed serial or parallel data transfer rates of up to 8,600 baud are also available.

Both terminals include a blinking character capability and scroll mode operation.

Exhibitors Forced Into Stop-Gap Measures to Keep Phone Service

By Ronald A. Frank

CW Communications Editor
LAS VEGAS—The demanding telephone requirements of computer users were vividly brought to light last week by exhibitors at the FJCC.

Despite the fact that AT&T made available 300 extra data modems and assigned 58 additional longlines augment circuits to handle the anticipated crush for voice grade circuits, the demand was just too much for local telephone facilities.

Exhibitors complained to Aflips about communications facilities during a meeting held to discuss their problems. At the session, firms revealed the stop-gap measures they employed during the show to insure their access to the switched network.

One exhibitor told CW that he could not take a chance on lines not being available when needed. "In order to be sure that we could set a line, we held our circuits open 24 hours a day for the duration of the show," he said. He added that although this cost his company more than \$600/day, it was infinitely more effective than trying to obtain a line when needed.

Another representative said that when his firm operated on-line with a remote site, "strange disconnections" occurred.

Asked about these problems, a spokesman for the Southern Nevada Division of the Central Telephone Co. said that as far as his firm was aware, only a few minor complaints were recorded. He added that Central felt the conference gave data users less

problems with telephone facilities than those experienced at previous joint computer conferences in Boston and San Francisco.

"If any communications problems did exist," he said, "we would welcome hearing from those affected. As far as we know, our service was adequate for the duration of the show."

The telephone spokesman characterized the FJCC as not an unusually large convention for Las Vegas, although he did admit that the line requirements of computer users were probably

heavier.

Exhibitors who relied on the dial-up availability of voice grade lines said that when they wanted to display their equipment in a communications mode, outgoing lines from the Convention Hall were often difficult to obtain.

"Potential customers would not wait until we managed to establish a clear line," one exhibitor said. "In peak periods, the heavy usage of telephone lines at the Convention Center made it almost impossible for us to demonstrate our communications equipment."

CDC, UCC System Handles Batch, On-Line Terminals

LAS VEGAS—Control Data Corp. and United Computing Systems Inc. have announced a jointly developed software operating system designed for a broad range of time-sharing applications.

The operating system, called Kronos by CDC and UCS VI by United Computing, features three concurrent processing modes, interactive time-sharing, remote batch, and local batch.

In fully interactive on-line time-sharing applications, Kronos can accommodate up to 384 terminal lines, as well as local batch processing. For remote batch processing, the system can handle 256 lines and 16 CDC user terminals, the companies said.

User languages available with Kronos include Fortran, Basic, Text Editor, and Algol for both interactive and batch processing. Cobol, Sort/Merge, Perl/Time, Aps, and Optima are available for batch processing exclusively, according to the developers.

With the operating system, files can be accessed simultaneously by several users but individual users can still exercise complete control through password protection, the companies claim.

UCS VI is being offered by United Computing across the nation for on-line availability in major cities to time-shared and batched processing users. The new service utilizes a CDC 6400 series computer system installed at the Kansas data processing center in Kansas City.

Other Equipment Shown



Sangam's DS 7200 Data Pooler



Amplex Data Recorder and Cartridge



Casius Disk Cartridge Drive



Telex Multifomat Tape Drive



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Teletype Unveils New Line of Tape Terminals



Teletype Magnetic Tape Terminal

LAS VEGAS - A new family of magnetic tape terminals compatible with its existing equipment was unveiled here by the Bell System.

The device, according to Teletype Vice-President John Auswarter, adds high-speed on-line capabilities to both the lower-speed terminals, and the Dataspaced services of AT&T. The unit operates at 2,400 words/min.

The Teletype Magnetic Tape Terminal offers storage capacity, for each cartridge, of 150,000 characters, or 30,000 words. Each 100 ft. cartridge can be searched for a particular file, in a manner similar to that used for the IBM Magnetic Tape to Selectric Typewriter system (MTST).

The system can be attached, the company says, to any Model 33, 35, 37, or Inktronic terminal station. Tape can be transmitted and received at tape speeds and, later, printed out off-line, Auswarter says.

No attempt has been made, he explained, to make these cartridge units compatible with computer tapes. However, he pointed out, there are no limitations when transmitting to a remote computer, since the data is received and transmitted in standard ASCII format.

Search Capability

Up to seven predefined characters may be "flagged" for later text searching. Selection of the desired character causes the tape to be searched until the selected character is detected.

Several "files" may be stored on a single cartridge, the company says. Each file may be located by number, permitting rapid access to selected segments of data, the company claims.

Availability

Bell announced that the systems would become available during July of next year. Rapid deliveries are to be expected at that time, the company says.

Receive-Only Printer

The unit can be easily combined with the Inktronic Receive-Only (R/O) terminal, permitting direct printing at speeds of 1,200 words/min in complete silence.

The unit will operate at 750 words/min with Dataspaced Type 5 terminals, and at 1,050 words/min with Type 2 terminals, the company says.

The unit uses the Series 200 or 400 data sets, for communication over regular telephone lines, according to Bell.



Loading Tape Terminal

Raytheon Announces Mini-Unit And 360-Compatible CRT Display

LAS VEGAS - Raytheon announced a minicomputer, its first, and a 360-compatible CRT display console.

The Raytheon 704 minicomputer, fully compatible with the 706 and 703 computers, has more than 300 programs and subroutines available, all said by Raytheon to be proven in use. The 704 includes, in its minimum configuration, a central processor with 16-bit words and 74 instructions, 4,096 words of core memory with 1.5 msec/

cycle time, byte manipulations, direct and indexed addressing, the largest page size in its class, one level of automatic priority interrupt (expandable to 16), and an operator console with a lockout key switch.

The price of the minimum configuration will be about \$10,000, the company said.

Options include memory expansion to 16,384 words, high speed direct memory access, memory parity, hardware multiply/divide, hardware bootstrap, interrupt expansion to four or 16 levels, real-time clock, ASR 33 or 35 Teletype, a multiplexer with a 12-bit A-to-D converter with power supply and power fail-safe.

Standard peripherals such as Teletype, paper tape, card equipment, magnetic tape, disc memory,

analog-to-digital and digital-to-analog converters, timers, and plotters can be added in the field, the company said.

The software library includes conversational and 360-compatible Fortran IV, and real-time executives and monitors that are said by Raytheon to enable the 704 to be used for multiprogramming and real-time batch processing. A mathematics library is also included.

The Dids-400 display units are available as either stand-alone units that contain their own control and interface circuitry for remote single unit sites, or as consoles intended for use with a control unit in multiconsole applications. Control units and multiplexers are available as part of the product line.

New Computer Joins General Automation Line

LAS VEGAS - General Automation made a pre-announcement of its newest extension to the SPC line of control computers, the SPC-16. This, the largest of the SPC series, will feature higher throughput rates than its predecessor, the SPC-12, the company said. Compatible with earlier models the SPC-16 will feature a 16-bit word length with a memory cycle of 960 nanoseconds and a storage capacity of 4K, 6K, 16K, or 32K words. The device will be equipped with eight general-purpose hardware registers. The instruction repertoire will be an extension of SPC-12's and will permit data to be bit, byte, or word formatted. General Automation claims that the execution time for an instruction will be under 400 nanoseconds.

The SPC-16 will use a parallel I/O system, similar to that of current SPC-12. This design feature is said to minimize the need for external hardware. Up to 15 General Automation miniconrollers (system interface units) can be attached to the I/O circuitry. The miniconrollers are designed to interface and control instruments, peripherals, data sets, displays, and keyboards.



Sanders System 6000

Sanders demonstrated their System 6000 display data recorder and controller configuration. Sanders says the system can take up to 12 operator stations and there is no need for tape pooling. Data batches are automatically merged on a single real of tape.

Head Hunters Promote, Manipulate, and Entertain

LAS VEGAS If any of the people who attended this year's FICC switch jobs in the next few weeks, it may be attributable to the "head-hunters."

One man said that he had, on opening his hotel door one morning, found seven polite invitations to drop by one of several suites reserved specifically for separating a man from his job.

"They would be perfectly happy to sell us one of our own employees, if they thought different people might interview him," a company president said.

With the tremendous shortage of available, trained, and competent personnel, even the most dignified of companies have resorted to such hiring techniques, CW was told by one of the recruitment operators. He explained that his firm could make an average of \$1,500 for every person it placed, easily paying for all the suites, food, entertainment, liquor, and promotional techniques.

TLW Computerworld SALES Corner

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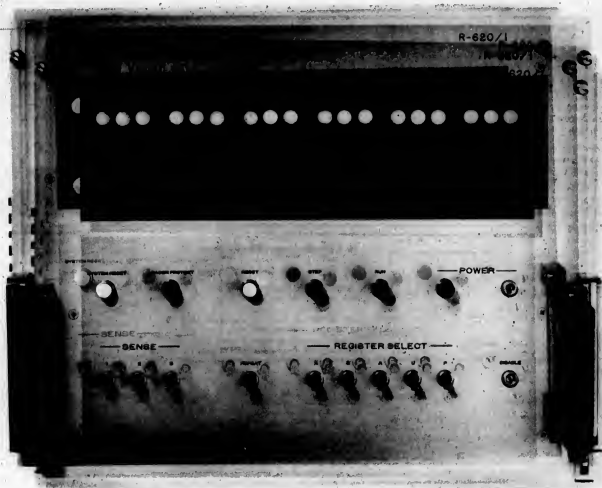
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Editorials

FJCC Problems

Congratulations, Afips! This year's Fall Joint Computer Conference represented, in many areas, a major improvement over the last few shows.

Exhibit space was nearly sufficient to house all the companies who wanted to be in the show, conference facilities for technical sessions and the exhibits were reasonable, and support facilities, such as electricians, telephones, and labor, were adequate.

But improvements in these areas have brought other problems to the top of the list.

Where can you find sleeping accommodations for two or three times the number of people who were expected to attend? Afips announced, in the *Las Vegas Sun*, that about 15,000 people were expected. But when the final totals are compiled, it looks like the figure will be more like 35,000 to 45,000. Las Vegas only has sleeping accommodations for about 35,000. People were forced to sleep in hotels as far away as Boulder City, Ariz., and on cots in the Convention Center.

Some veteran conference attendees now estimate that the spring conference in Atlantic City, N.J., may draw 85,000 people and next fall's conference in Houston, Texas, may draw nearly 100,000 people. These cities seem inadequate for such large conferences.

Neither city offers adequate transportation to handle the entrance and exit of such large numbers of people. Moreover, based on past experience, neither city will receive adequate warning of the real size of the attendance.

Some different techniques are going to have to be developed, and quickly, to cope with these problems at future conferences.



—Was It Really Worth It?

Letters to the Editor

Is CW Making Too Much

Of Privacy in Job Matching?

Regarding the flap over computerized job banks and invasion of privacy, I am glad to see that *Computerworld* is taking a stand on the social implications of this very important issue, but I wonder if you are not making too much of it.

At the risk of seeming obvious, let me describe what I think are the essentials of man/job matching. Computerized job matching requires that individuals input their qualifications in resume form to be coded and entered into a master file. Job specifications are compared against people qualifications in a scan/search and the resulting matches become job applicant referrals. Very simple and straight-forward. The "hits" are candidates for the jobs at this point.

At some later point in the process, it is necessary to identify the individual to the requester. Your analogy between the man/job bank and the Telequote stock service misses one significant point: The Telequote is simply information retrieval of facts about known quantities at a point in time: price, volume, trading range, etc. The record for which information is requested is a single, inanimate, constant unit. There is no pre-screening of the facts. The information retrieval process is completely reactive. There are no iterations. Whatever the output, the requester must accept it at face validity.

Job matching, however, is a little more complicated. The unit of information — a candidate for the job opening — is dynamic; more than one can satisfy the search, and there can be iterations. The search results are communicated to the requester for further screening. He must review each candidate for his individual merit and decide to accept or reject. The computer has provided fewer, but more select, candidates to review. Its function was merely to pre-screen the facts (salary requirements vs. scale; geographical location of man vs. job; education or training required vs. deficiencies; etc.). At this point, the decision to accept is still tentative. The requester and the candidate must eventually come face-to-face for the final acceptance or rejection. There is very little anyone can do about maintaining privacy in that environment. Computer-produced resumes without names could be provided to the requester but I cannot imagine any profit-oriented organization making a final job commitment without some kind of investigation or interview. Certainly, privacy is "disturbed" whether it be done on a face-to-face basis or by

the approach used by Insurance Companies, Banks, Executive Search Firms, Security Agencies, the Federal Government, etc.

Which brings me to another point. Mr. Loftus of the Manpower Administration points out that a task force has been established to examine the issue of privacy. In its inimitable fashion, a federal government task force will be reviewing the issue long into the future and, most likely, long after the original proposal has been put to bed. I fail to see what the real problem is. So much of our private lives is recorded in some computer file or another somewhere that it makes little difference if I am known by name or by my Social Security number. There will always be some access through some agency to some part of my private life. This seems to be a fact of life, whether we like to admit it or not. Unfortunately, the job bank/privacy flap is something created by those of us who are very comfortable in our jobs with time on our hands to write letters like this. The man who is unemployed or underemployed could care less if his identity were made known to a prospective employer.

V.R. Ceriello
Associate

Information Science, Inc.
New City, N.Y.

Far privacy reasons, a person's un-coded identity should not be entered into the system and his identity certainly should not be made known to a prospective employer without his permission. Do you want your boss to accidentally find out you're looking for another job?

It's true that a person, willing to spend the time and money, can piece together a dossier on you. But do you want a computer to be able to do it in seconds at negligible cost? You're right that the unemployed person is in no position to worry about his privacy, and that's why it's important for us, the "comfortable" people, to speak out. Ed.

Computerworld welcomes comments from its readers. Preference will be given to letters of 250 words or less. *Computerworld* reserves the right to edit letters for purposes of clarity and brevity. Letters should be addressed to: Editor, *Computerworld*, 797 Washington St., Newton, Mass. 02160.



COMPUTERWORLD



Federal Regulation of Data Acquisition Needed to Protect Privacy, Ervin Says

WASHINGTON, D.C. — Federal regulation of the use of computers in compiling data on private individuals was proposed earlier this month by a North Carolina senator.

"At a conference on management science and information systems at the University of Pennsylvania's Wharton School of Finance and Commerce, Sen. Sam J. Ervin said that the most effective action Congress could take is the enactment of laws controlling the collection and use of data in certain areas."

"Computers represent a magnificent contribution to the progress of mankind," Sen. Ervin said.

However, he continued, the impact of infallibility that the computer has acquired through folklore is not the image it has in the minds of those who have been or will be victimized or harassed by a computer.

Privacy-Affected

The number of citizens whose privacy is affected is vast, he said. A survey by the Senate Administrative Practices Subcommittee two years ago revealed that "our names alone are in government files 2,800 million times. Our Social Security numbers are listed 1,500 million times. Police records number 264,500 million; medical histories, 342 million; and psychiatric histories, 279 million times."

Government Use of Computers

Sen. Ervin cited several instances of government use of computers to collect and store information about people.

"The new plan of the Department of Health, Education, and Welfare to tie in a national welfare program with the social security system raises specters of surveillance and privacy invasion on a scale never before experienced," he said.

There is also the Secret Service's well-meaning program to keep track of people who might

harm the President or other public officials. Included in this file is information on individuals who make oral or written statements about high government officials that constitute threats, irrational statements, or abusive statements; information on professional gate crashers; and information on persons who contact high government officials for the purpose of redressing imaginary grievances.

Many people, he continued, believe that the place to start with a complaint is with the President or Vice-President. Yet some of these people who write a strong letter never know that they have been fed into yet another government data system.

Thousands of Complaints

It has been estimated that by 1970 the total statistical budget of the Federal Government will exceed \$200 million. If complaints to Congress are any indication, Sen. Ervin said, the impact on individual rights of these statistical programs is providing devastating results.

Congress has also received complaints about the practices of large credit companies, Ervin continued. "With their gigantic computerized data systems, they induce the most personal revela-

tions out of the individual through subtle threats or inducements of credit clearance. Yet the individual's buying and borrowing ability in this country and abroad is governed by the rapid computer transmission of information about him."

Remedies

To mitigate, much less prevent these threats, the senator said, there must be controls of several kinds.

- There must be technical and mechanical security devices built into the machine.

- There must be controls for those who operate and who control the machines.

- To assure substantive due process, there must be controls over computer input and output.

- Some system must be devised to give the individual a chance to explain personal data susceptible to derogatory information.

- Congress should enact laws to control the collection and use of data in certain areas.

The Federal Government should establish an independent regulatory agency to control the vast problem of computer technology in the same way that other communications problems are handled.

Bill Francisco explains how he turns discarded punched tape into pottery.

Old Punched Tape Used To Make Decorations

NEW YORK — Bill Francisco's dislike of throwing anything away has led him to develop an unusual, computer-age art form.

Francisco, 38, of Flushing, N.Y., an American Air Lines supervisor, has found a fascinating use for the very durable — and heretofore useless — discarded punch tapes.

It came to him one day as the punch tapes fell from the machine onto the floor, forming unusual shapes and swirls as they tumbled out.

Francisco got permission to take some of the tapes home and, since then, has been turning out vases, candlesticks, urns, and pottery.

Using a home-made wheel much like that employed by potters, Francisco winds the tape into shape, treats it with glazes, then adds coloring or antiquing, finishing off with hardware.

Supervisor of agency and commercial sales audits for American, Francisco says his work is getting to be "quite popular," primarily because each piece is an original.

"They're mainly conversation pieces," he said, noting the pieces won't hold water — at least, not for long — limiting them to use as decorations.

Through trial and error he discovered a gluing process which almost solidifies the tape. After it hardens, the pieces are colored and hardware from discarded furniture added.

Coloring turns the tape products to the greens, blues, and

golds similar to the hues found on old iron pieces.

Francisco, currently working on cornucopias for Thanksgiving, spends about three or four hours on each piece.

He's thinking about starting a mail order business or, at least, going around to art shows to display his wares.

He's worked with pink, yellow, and black tapes and has been trying to find other colors, which he understands are available.

No Agreement on Goals

SicCas' Holds a Small, Spirited Meeting

LAS VEGAS — Small, spirited, and splintered described the first official meeting of the ACM's recently formed Special Interest Committee on Computers and Society (SicCas) at the Fall Joint Computer Conference.

Only about 30 concerned professionals attended the evening session, which faced no organized competition, other than the city's fabled one-armed bandits and other amusements.

"It's unfortunate," said Robert P. Bigelow, committee chairman, "And I've got a mailing list of between 150-200 names, too," he added.

Since the group's inception, both project-oriented and administrative subcommittees have been established. Project committees include data banks and privacy; jobs and automation; and education. Administrative committees have been formed

for inter-society liaison, local chapter liaison, the newsletter, and program planning — a hot potato that cornered the discussion until after 11 p.m.

Under ACM bylaws, the committee will be faced with dissolution by August unless it can produce a petition requesting self-governing "group" status signed by 100 ACM members. A previous attempt to collect the requisite signatures fell short of the necessary total.

Among those voicing sharply divergent views in the heated "where do we go from here" discussion were Bernard Galler, ACM president, Donn Parker, ACM national secretary, and Edward Elkind, Computer Professionals for Peace.

Plans for SicCas gained little structure in about two hours of discussion, as the group struggled to achieve some focus on

"LAS VEGAS — The session on "The Computer Society and Privacy Controversy" had one of the largest, if not the largest, attendance records for a meeting on this subject to date.

About 1,000 people gathered as the session started. Three hours later, there were still several hundred in the room.

Jerome Lobel of Ernst & Ernst, session chairman, reported that the early divergence of the session into a discussion of commercial areas of computer data

risks—as opposed to government classified hazards—apparently sparked more interest in the subject than he has witnessed before.

Highlight of the meeting appeared to be the concern of a number of members of the audience about whether or not time-sharing companies are doing everything they can to protect user data files from accidental or intentional compromise."

Another highlight of the session was a lively discussion between Clark Weissman of IBM and Robert Courtwright of SDC about the potential damage to an information system that could result from a power failure.

Dr. Willis Ware of Rand Corp. indicated that computer security problems are not insurmountable and that if everyone in the computer industry did his part, computer data security risks of the 1970s could be significantly reduced.

New Trial Rejected in Error Case

FRANKFORT, Ky. — An appeal for a new trial by the Ford Motor Credit Co. was rejected here in a case in which a computer error led to the wrongful repossession of an automobile.

Appellate Judge Scott Reed upheld an earlier decision to award \$7,000 damages to John T. Swares.

Although he had been making

the proper payments, Swares' car was repossessed when the company's computers indicated that he had been delinquent in his payments.

"In this computerized age," the judge said, "the law must require that men in the use of computer data regard the data as more important than a perforation on a computer card."



Not Topless, But Beautiful

Novation, manufacturer of sound reducing enclosures for Teletypes, transformed their exhibit area into an art gallery that surrounded several of their enclosures. Later the sculptures and paintings were raffled off.

Ladies Committee Activities Swamped, Attendees' Response Unprecedented

LAS VEGAS — The activities of the Fall Joint Computer Conference ladies committee were hard to miss — partly because of the 5-in. blue and green feather flowers worn by committee members, but mostly because of the unprecedented number of attendees.

By 3 p.m. of the first day, registrations had topped 650, and committee chairman Ann Ratachak beamed. "The response has been greater than anything we ever anticipated!"

Her sentiment was borne out more than once. At noon, about 200 wives showed up for a scheduled luncheon, precisely twice the number of prepared meals. Feminine ingenuity prevailed, however, and all were served. "Boy, we really stretched that chicken!" admitted committee member Chris White with a smile.

They ran short a second time in mid-afternoon, when their

supply of 400 colorful Mexican cactus-cloth tote bags gave out. The wives were clearly interested in more than flowers, bags, and luncheons. Some 300 of them, eager to bridge their family communications gap, attended a morning session entitled, "What's It All About, Alfie?," a program designed to interface wives and the world of computers.

Some elementary programming was even accomplished at that meeting, and one conference wife from Illinois stated, "My husband is really proud of me! I haven't gambled very much at all, and now I know a little more about his business."

The combination of late evenings and early, more informal morning meetings presented problems for some. One lady skirted the wardrobe dilemma, however, by showing up attired in a mink-collared suede coat, slacks, and sneakers.

No Topless Girls

Competition From Girls Cited As One Problem Eliminated

LAS VEGAS — "With 175 new exhibitors and a Las Vegas atmosphere, I was afraid they'd go up on bosoms," said Charles Asmus, executive secretary of Afips, the conference sponsor. "But they didn't."

Not only were none of the exhibit girls topless, there weren't even many of them compared with the spring carnival in Boston. Microskirts and flashy costumes were still the fashion, but the girls were more subdued in their actions and vocal patter. Many of the exhibits were staffed entirely or almost entirely by men, suggesting that girls took too much attention away from the products.

Power Supply Problems

The computer conferences require huge amounts of power, the most of any exhibition in the world today, Asmus said.

"Not only is the consumption

high, but there are multiple peculiar demands."

In advance of the conference, the power supply and distribution systems were doubled at both the Convention Center and the Sahara Hotel Exhibition Center.

Communications represented another problem. "We told the Las Vegas telephone company what to expect six months ago," Asmus said. "We gave them the statistics on the Boston show and told them to double them."

"We ended up needing more than double the requirements,"

he said.

More than 300 data lines were installed on the floor of the main exhibition area.

Money Makers

Afips picked up about \$750,000 in gross revenue from the exhibit, but much of this will be eaten up by expenses. Final figures are not yet available.

The cost to exhibitors is high, running from a minimum of about \$6,000 to more than \$250,000 for the three-day show.

Biggest Gamblers Operate In Exhibit Hall, Not Casino

LAS VEGAS — Some of the biggest gamblers were in the exhibit halls, not the casinos. Many of the exhibitors were in registration, about to float a new issue, or still running on private money but looking toward the day when they go into registration.

They are gambling that they can build a successful company, and the investing public is gambling that they'll make good.

Another breed of gamblers prowling the exhibits were representatives of firms looking for companies with a good device and sufficient capital. Such companies are often ripe for

mergers, acquisitions, or other financial deals.

Portable Exhibit

Exhibitors ranged all the way from the giants like Control Data, which displayed a CDC 6400 system, down to the man who arrived by plane with his minicomputer on his lap.

Asked how long his device had been operational, one exhibitor replied, "About three hours."

Of the some 60 exhibitors who cancelled out of the show, many said it was because their products weren't operational yet.

There may well have been more money won and lost in the exhibit halls than in the casinos.

Button Button, Where Is My Mate?

LAS VEGAS — "Software is a Social Disease," "Go Forth and Multiplex," "I Pray in Fortran," and so they went. Probably 50 different buttons were floating around Las Vegas during EJC. They were handed out at booths, in hospitality suites, and just around. Many didn't even carry a commercial. But, they showed where you'd been.

One company handed out "Meet Your Mate" buttons with a number on them. If you met someone with a button carrying the same number, you took your "mate" to the booth and got a prize.

Even staid AT&T, now undergoing a revamping for a more youthful look, had a psychedelic

button saying, "The Bell System Goes Magnetic."

The buttons were only one of the gimmicks used to impress visitors. Several exhibitors had plotters drawing the perennial nudes. Iomec brought 10,000

mini-frisbees marked "Iodics."

Bit Inc. and CTC handed out "gambling money." A free trip to Bermuda was the prize in another booth. At least three booths had systems playing blackjack or shooting craps.



'Very Interesting'

The Photon System G transformed rough sketches onto a paper tape that later would be used to make a clean master drawing. The input unit console required a pretty girl to operate effectively.



Checking Heart Beat

Control Data demonstrated their new SC1700 computer by analyzing and interpreting the heart beats of a model wired wrist and ankle to a Cambridge Composite electrocardiograph.

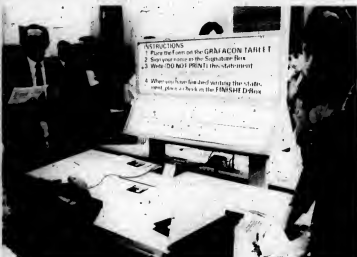
FJCC Conference Sights at Las Vegas



The delicate design of the Sanders' booth was complimented by the bright spot lights.



Digital, CalComp, and GE were only a few of the companies seen from the top of the Control Data observation platform.



Raytheon's handwriting analyzer computer used a Bolt, Beranek, and Newman graphic input terminal. It told the writers under analysis only their good attributes.



The only thing that came out of the RCA's magicians top hat was RCA memory products.



Sparkling spheres presented sections of Lockheed's CM 300 (IBM 360 compatible bulk core memory) over the memory unit itself.

FJCC Conference Sights at Las Vegas



Ferroxcube combined pretty girls and animated memory stacks in their presentation.

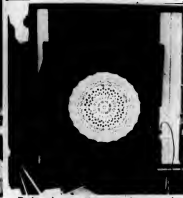


Sangamo storks carried the good news of three new additions to the Sangamo line that included a tape pooler.



Ominitec appeared poised for a moon landing of its own.

COMPUTERWORLD
PHOTO FEATURE
BY VIC FARMER



Redcor heat patterns turning on axis on their 755 display system.



Data General's display aims to get the message across—one way or the other.



Although the artist may have not known what a light pen was, he attracted the desired attention to EMR's graphic display.

FICC Conference Sights at Las Vegas



Pick a card . . .



And I'll show you!



How much better Dynelec Systems is.



Varian provided a short history lesson that showed the firm's progress since 1965.



IBM showed its System 3 and two communications units under glowing globes of colored light.



Edutronics offered more than cookies from behind the drug store counter.



A holiday trip to Nassau and an inexpensive keyboard-to-tape cartridge terminal highlighted the Data Input Devices display.

DPMA Holds Unbundling Briefing

IBM Seen Competing for Software, Services Markets

LOS ANGELES — An "unbundling briefing" from the user's point of view is being held by the Data Processing Management Association in six major cities. The first was held in Los Angeles Nov. 13. Users were told that their data processing costs will go up from 5 to 20% after unbundling, IBM's policy of sep-

arately pricing products and services, goes into effect Jan. 1.

An audience of users heard George J. Ravazzolo, president of Advanced System Inc., speak on education costs and alternatives; Ronald L. Lowe, manager of administrative services for Arthur Anderson & Co., speak on systems engineering aspects,

and William J. Bresnahan, president of Bresnahan Computer Leasing Co., analyze software costs.

Ravazzolo told the users that if they continue to use IBM's education services as they have in the past, their overall costs will go up 10%.

Lowe said that where systems

engineers formerly were free, they can now cost the user \$1,000 a week or the price of four System/36.

Bresnahan expressed the opinion that IBM would have unbundled without government pressure as the systems engineering and education divisions were nonprofit and studies into put-

ting them into the profit scheme were underway before the antitrust pressure. Another reason, he noted, is that IBM wanted to get into the burgeoning software field as an area for future profit growth.

All three speakers told CW that IBM was not keeping a price umbrella over these areas — education, systems engineering, and software — but was directly competitive in price. They felt this indicates that IBM wants the markets. They also thought that IBM will dominate these fields, not by the 70-75% that it has of the computer market, but by 90%.

Ravazzolo was the first speaker. He launched his talk by saying, "The mobility of programmers and analysts will get worse. We haven't seen anything yet. This will be due to companies beefing up their staffs to take up the slack for unbundling."

The users were then told they must conceive an education plan for their companies.

Ravazzolo said that education needs can no longer be left to IBM unless the user wants a large increase in his costs; that unbundling is going to increase the need for employee training due to increased mobility, and that the only alternatives are to pirate or to go outside and hire a facilities management firm.

The best way to beat pirating of your own people is to have an in-house career path program supported by the education means, he said.

Plane Wrecks ADR Building, Systems Saved

PRINCETON, N.J. — Applied Data Research, Inc., has resumed its normal activities following the crash of a private airplane into the company's leased headquarters.

The second floor of the building was almost entirely destroyed by fire, and the first floor was damaged by smoke and water.

"Both of our computer systems were saved, essentially in their entirety," said Warren Spaulding, vice-president of the company. "The 360 system is operating at an IBM facility in Dayton, N.J., and the PDP-10 is being checked out at the Applied Logic Corp."

"We were in the process of expanding our facilities at the time of the fire, and had another 6,600 sq ft that we were ready to move into, and we obtained more space in the same building that was uncommitted at the time of the accident," he said.

"Our corporate offices and our technical personnel are now operating from the new building," he said.

There was no loss of technical information in the fire, according to Spaulding. All of the information preserved on tape or disk as well as the master card files was saved.

The pilot of the plane, a president of an exterminating company, was released from the hospital following treatment.

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- 11. Other _____

November 26, 1989

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A sample portfolio report generated from Xport

'Clo' Package Determines Pieces Cut From Material

RICHMOND PARK, Ill. A package named "Clo" (cutting layout optimization) is intended for use by companies that cut coils in big sheets of any material into smaller pieces and want to reduce the amount of waste generated.

The program, written in Fortran, will operate on an 8K, one disk, IBM 1130 or any equivalent of larger machine, according to the company, Data for Management Decisions, Inc. (DMD). An inventory of available raw materials that may be permanently stock stored and a list of the products to be made are the input of the program.

The package determines the pieces to be cut from raw material, the arrangement on the

sheet, the quantities of each item to be made per sheet, and the percentage waste generated from each particular cutting arrangement.

The program is available to operation in a generalized form which is priced at around \$3,000, including documentation and support. Clo can be tailored to meet the specific requirements of a given user before delivery.

It also includes arrangement of the program to handle either sheet or coil stock, consideration for various material thicknesses and optimizing the program to fit the user's hardware configuration.

DMD is located at 22335 Governors Highway.

Linear A Routines Compress and Modify Data for Transmission

PHOENIX A package of file compression routines designed to compact alphabetic data sorted on tape or disk has been developed by Academy Computing Corp.

The package, named Linear A, compresses data and puts it into new representation, making it easily transmittable, according to its designer, B.C. Lambert. Lambert further describes Linear A as "about as machine computable as Fortran."

Linear A allows users of time-sharing computers to shrink their files, according to the company. However, the routines may be used by anyone who has large files of alphabetic data, the company continues.

The routines work on two kinds of data: repetitive data

such as contained in directories and nonrepetitive data such as ordinary discourse.

Repetitive data can be processed on up to 4K of core memory; nonrepetitive data with a required lexicon runs on up to 12K of core.

Linear A is written in Fortran and Basic and runs on the CF-430 and V65 systems, although it was originally developed on the IBM 360/10. With about 100 instructions, Linear A can be rewritten in machine language for use with other machines.

The package is available free of charge to customers of Academy Computing's time-sharing service.

Academy Computing Corp. is located at 3424 North Central

Xport Provides Brokers With On-Line Access to Portfolio Appraisals

WALTHAM, Mass. An on-line computer program, called Xport (on-line time-shared system), provides money managers with instantaneous access to personal portfolio appraisal information.

With Xport, the user at his remote terminal can direct the computer in simple English-language terms such as "buy," "sell," "add," or "delete" and receive back an immediate appraisal of any specific portfolio, according to the company. Positions in all classes of securities, including bonds and cash, can be instantly determined and evaluated.

The program is offered nationwide from Interactive Data Corp. It is an extension of the company's basic financial information storage and retrieval service, centering around a financial data base and used with a 360/67 computer.

With a single command for each transaction, Xport will adjust holdings for stock dividends and splits across all portfolios, determine cash balances at any given time, and provide immediate and automatic access to current prices for about 4,500 common stocks, including all New York and American Stock Exchange listings, as well as some 1,800 sold over-the-counter.

The users also can obtain desired asset and subasset classifications from the computer, and, within minutes, complete portfolio appraisal can be printed out.

Xport can be used as a bookkeeping operation. For example, if a stock is sold, the "sell" command tells the computer to post the appropriate information.

The program is written in Cobol, Fortran, and Assembly Language, and the storage capacity of the system is "practically infinite," according to a company spokesman.

Charges vary for customers and noncustomers and depend on the number of copies, amount of transactions, and number of securities. The price range is from about \$2 to \$11 for 150 transactions with 120 listed securities per month.

Interactive Data Corp. is located at 486 Totten Pond Road,

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Services and Software Announced for Personnel and Recruitment Fields

Among recently announced services and software packages are several designed specifically for the personnel and professional recruitment fields. These include a temporary keypunch service, a data processing career planning service, and a personnel skills inventory system.

Keypunch Service

A personnel service devoted to supplying temporary keypunch operators is available for the northern New Jersey and New York metropolitan area.

Called Data-Girl Service, the firm has operators under contract to work anywhere within 25 miles of the company office and to be available for work on all regular shifts, according to the company. Data-Girls work only on clients' premises and may be obtained for periods ranging from a day to a month or longer, the company said.

The firm is a division of Sales Advisory Computer Service.

Carl Patella, executive vice-president of the company, said "for security reasons many organizations, such as banks and credit bureaus, just cannot allow data processing operations to be handled outside their offices."

"At the same time, these companies' keypunch staffs suffer the same peak load and personnel shortages common to businesses in general," he continued.

EDP Career Planning

Data Systems Services offers management consulting in data processing training and education to industry, government agencies, and school systems.

The service includes curriculum design and career planning for data processing personnel and executive management, according to Roy Student, director of the service. In-house courses may be developed for an industry.

Hazeltine Corp., parent firm of Data Systems, is one of the users of the service.

The service charge is calculated per hour basis and depends on the individual installation.

DSS is located at 59-25 Little Neck Parkway, Little Neck, N.Y.

Skills Inventory

A skills inventory system featuring selective retrieval of combinations of personnel parameters such as experience, education,

special interests, and wage/salary level has been developed by Grace Computer Services, a division of W.R. Grace & Co.

The basic file contains Social Security number, descriptive and coded data. The codes can be automatically converted to equivalent descriptions when retrieved and reported. Input format is flexible.

Retrieval is by selection cards specifying conditions and logical combinations of conditions to be met. Up to 32 independent retrieval requests may be run at one time.

Three reports are produced: an occurrence count vs. selection criteria, a list of Social Security numbers for selected personnel, and an optional report containing descriptions and codes that the user selects.

Formats for use in Cobol and Basic may be stored in the system for immediate use. A nonprogrammer can specify the reports to be produced.

The system is written in Cobol and Basic, and runs on a 65K 360/30 (or larger) under DOS.

The system is said to cost \$3,800, including company-furnished installation, modification when necessary, maintenance, training, and documentation.

The system is available through Cullinane Corp., 60 State St., Boston, Mass.

Package Performs Accounting Functions

ENGLISHTOWN, Colo. A Fortran IV remote batch business package (RBBP), a corporate accounting system, will be available in the first quarter of 1990.

The package will be offered in addition to Computing Corp. of America's time-sharing business package and will perform the basic accounting functions including payroll, accounts payable and receivable, inventory

control, and balance sheet. A variety of information handling routines are also supplied.

The RBBP consists of individual modules for each of the basic accounting functions. Each module may be used separately as a stand-alone program or as a part of the total package, resulting in an integrated corporate accounting system, according to CCA.

A variety of high-speed termi-

nal equipment compatible with RBBP will also be available, the firm says.

Price for the package ranges from \$20,000 to \$40,000, depending upon the computer and operating system. Installation, training, and complete systems and operators documentation are said to be included.

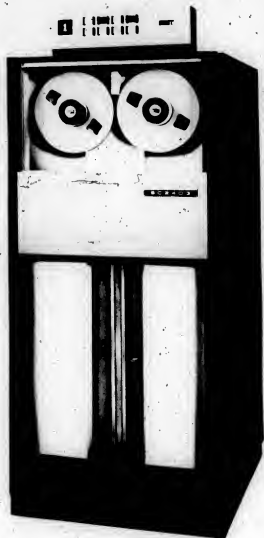
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Bernard Strassburg, FCC bureau chief, addresses communications users at conference session discussing telephone network interconnection.

Communications Users Challenge FCC's Strassburg on Tariffs at Conference

By Ronald A. Frank
CWI Communications Editor

NEW YORK — Predictions that any Touch-Tone telephone could become a computer terminal with commercially manufactured equipment being used on the telephone network were among the points of interest raised at a conference of communications users here last week.

The meetings were sponsored by the Digitronics Users Association, and featured a panel discussion for computer users on the current and future status of data communications interconnecting with the switched telephone network.

Bernard Strassburg, chief of

the common carrier bureau of the Federal Communications Commission, appeared as a panel member to inform DUA members of latest developments in the continuing FCC computer inquiry.

During a question and answer period, several delegates challenged Strassburg on the apparent slow progress being made by the FCC in resolving current problems.

One user specifically asked why tariffs have traditionally been based on recommendations made by common carriers, such as the telephone companies? The questioner further suggested that FCC tariffs should do more to protect the user, and added that

tariffs should specify the level of maintenance to which the customer is entitled.

Appearing with Strassburg was Donald Baker, chief of the evaluation section, Department of Justice antitrust division.

Baker was instrumental in obtaining the recent Government ruling, known as the Carterfone decision that led to the attachment of non-Bell System equipment to the telephone network. Baker said that the telephone companies will have to prove conclusively that the interconnection of so-called foreign equipment will cause serious technical harm to the message network.

Communications

Should Cross Examine

He suggested that interested parties including computer users should "be given a full opportunity to cross examine the [telephone] carriers" on their claims of impending harm resulting from the interconnection of non-Bell equipment.

In this regard Strassburg said the FCC welcomed the opinions of computer data users at the various Commission hearings and studies now in progress. Gaylord Horton, vice-president of General Telephone & Electronics Corp., also participated on the panel and said that the telephone companies were certainly not opposed to the opening of the telephone network to commercially manufactured equipment.

He added that the carriers are only desirous of assuring that no harm will result to affect the network's technical integrity.

Horton added that current technology would make it possible to add pulse code modulation capability to the average telephone, making every telephone a potential computer terminal.

Other Suggestions

Among the suggestions raised were the possibility of the telephone companies charging a network usage fee only, with all technically compatible equipment allowed to interconnect freely with the network. It was also stressed that Congress should give the FCC the go-ahead to acquire a technical capability of its own so it will not have to depend on such bodies as the National Academy of Sciences for technical evaluations.

Nas is currently conducting a study for the FCC designed to define the technical problems of interconnection.

The Digitronics Users Association was founded in 1966, and claims to be the only association of data acquisition and communication equipment users. The DUS address is Box 113, Albertson, N.Y.

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Mini-Computer Controlled System Tests Equipment

SAN DIEGO, Calif. — A mini-computer controlled test system can subject complex pieces of digital and analog electronic equipment to 30,000 separate tests in less than two minutes, according to its developer, Convair Division of General Dynamics.

Designated Convair automatic test equipment (Cate) 1109, the system is controlled by a Varian 6201 computer with 16K of memory that allows a technician operator to initiate a test by typing in the part number of an item to be tested.

Cate 1109 has a testing capability of 10,000 units (ranging from electronic modules to rack-size systems) per month on a two-shift basis, according to Convair engineer B.A. Penner.

New Products

A feature of Cate 1109 is a switching system that allows simultaneous interconnection of test instruments to pins of the unit under test. The system includes a waveform analyzer, a pulse generator, a waveform generator, a volt-ohmmeter, and seven programmable power supplies.

Test programs are written in a simplified form of Fortran, with which the test writer records subroutines from the software library in the proper order.

The price for the basic station of Cate 1109 is about \$300,000. This price includes the Varian 6201 computer, a standard array

of programmable stimulus generators, programmable power supply, interface and switching system, and programmable measuring instruments.

Support includes installation, documentation, an instruction course, service and maintenance for three months, and six months of consultation, according to the manufacturer.

Delivery is six to ten months. The address of Convair Division of General Dynamics is Box 1128.



Convair Automatic Test Equipment

Display Designed for Graphical Output

HUDSON, Mass. — The Fastplot 1200 previewing display for incremental plotters is designed primarily for the computer center where graphical output is a requirement, according to the developers.

Dataplott Inc. says the Fastplot 1200 simulates a mechanical plotter, connecting directly to an interface and using standard plotting software. The display has a speed advantage of up to 100-to-1 over a mechanical plotter, depending on the software used, claims the company.

The user can do debugging and formatting at computer speeds, switching over to the plotter only when perfect hard copy is assured by the viewer image,

according to the company.

Graphic information is displayed on a large storage tube so that after a plot has been drawn on the screen, it remains there until erased. Scissoring and magnification features are included in the display, allowing the user to magnify any portion of the plot to the full size of the screen.

Versions of Fastplot 1200 are available for 11-in. and 30-in. incremental plotters.

If a computing center uses an off-line plotter, the Fastplot 1200 can be used as an on-line previewing and debugging display. In this way the plotting program stored on magnetic tape for plotting off-line is known to be correct, avoiding the delays in

continually returning tape for reprogramming, the firm says.

The display may be purchased for \$11,500. Leasing plans are



Fastplot 1200

available for as little as \$265 per month. Maximum delivery is 60 days, according to the company. Dataplott Inc. is located at Kane Industrial Drive.

360 EQUIPMENT WANTED

IPS is interested in obtaining a number of 360 systems, CPUs, and components for customers. Among the systems wanted are a 360/406 CPU or system, a 360/501, a 360/65 CPU, and 360/30 32K and 65K systems and processors. Peripheral units wanted include 2311's, 2314's, 2540's, 1403's, 2821's, 2400 tape units and 2803/2804 tape control units. If you have purchased equipment you anticipate selling in the near future, please write or call.

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Optical Mark Reader

CHATSWORTH, Calif. — An optical mark reader that reads

Device Scans Both Sides of Card

both sides of a card coded with 80 columns of 30 rows each instead of the standard 12 rows has been announced by Republic Electronic Systems, a division of Republic Corp.

Model 1501 reads standard punched information, giving the user the opportunity to precode repetitive information. In possible applications, the 30 rows might contain each of the 26 alphabetic characters, plus four special characters, or each column could contain six groups of

answers to multiple-choice questions.

The new unit costs \$76,000 or can be rented for \$1,500 per month. Read speed is rated at 1,500 cards per minute, whether reading both sides or just one, according to RES.

The unit has already been interfaced to computers in the Honeywell 200 series and to IBM 360s (Model 30 and up). Application packages and tab cards currently available include Fortran, school registration, and multiple-choice formats.

The unit can eliminate key-punching entirely and is said to enable preparation of direct computer input by such people as students, employees, and consumer panels.

The company is located at 9754 Dearing Ave.

Correction



Compu-Mad H-112 Controller



Tapa System Memory System

New Products photos were incorrectly identified in the Oct. 15 issue. The products are correctly identified here and additional details relating to prices and manufacturers can be obtained from the earlier story.

Developing an Information System? Call Dick Thoman at 513-961-5400 For Help

The help is called MARGEN and Dick Thoman is MARGEN's inventor. MARGEN's secret is its process for selecting data from your existing files and inter-relating them. A truly result-oriented system that does tedious, labor-intensive and costly tasks. Files can be created, reformatted, and updated. MARGEN's own compiler allows these processes to be controlled by concise

tree form logical and arithmetic statements. Only a few hours of training are required for a person to be capable of using the system. MARGEN is designed for IBM-360 Computers with a minimum of 65K under JES or OS. It's a flexible, load and go technique for use with your information system. Find out for yourself. Call Dick Thoman. Or write to



RANDOLPH DATA

Computer Systems Division
Randolph Data Services, Inc.
1428 East Madison Street
Cincinnati, Ohio 45208

New Products

\$15,000 Computer Includes Memory Protection Device

WESTMINSTER, Calif. — A \$14,995 system-oriented computer is being offered for use in areas such as production testing, numerical control, biomedical systems, well logging, computerized switching, statistical analysis, and information retrieval.

Multidata's Model A computer includes in its basic configuration 4,096 16-bit words of core memory, 32,768 words of disk memory, a memory access controller, a central processor, an input/output bus, and a teletypewriter with paper tape reader and punch.

Capabilities of the Model A include automatic program fragmentation, rapid context switching, privileged instructions, memory write protection, multi-level interrupt system, device independent input/output, command chaining, and data chaining.

A memory map is complement of 20-nsec registers in the controller keeps track of the page assigned to each program segment. The map provision for memory protection allows pages to be locked for no access, read only, or read and write, the company says.

Each memory module operates

at an 880-nsec cycle time. The Model A accommodates up to 16 modules (65,536 words), and each module requires the insertion of one printed circuit board assembly.

The input/output bus handles data rates up to 100,000 word/sec. For devices requiring higher data rates, the (optional) direct access channel approaches 1,000,000 word/sec, the firm claims.

Multidata Corp. is located at 15142 Goldenwest Circle.

7700 Computer Performance Analyzer Monitors Up to 18 Separate Operations

CHERRY HILL, N.J. — A computer performance analyzer has been developed by Computer and Programming Analysis, Inc. for users to analyze the operation of their system.

The CPA Series 7700 analyzer consists of modular units capable of monitoring up to 18 different computer functions without interfering with normal computer operations, according to the company.

The unit consists of a control module; a counter module, and probes. The control module supplies the power and master control functions for the system. The counter module uses binary clocking circuitry to supply synchronized timing information

in direct, real-time with increments as small as one ten-thousandth of an hour, according to the firm.

The interface to the computing system of the CPA 7700, a set of universal high-impedance differential amplifier probes, makes the analyzer compatible for use with any existing computer system, the company claims.

The unit costs less than \$5,000. The company will install the analyzer. Cost for the three-day training is \$500. After training, the price is \$150/day, on a rental basis.

Computer and Programming Analysis, Inc. is located at 1103 Kings Highway North.



Performance Analyzer

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Time-shared input cuts data preparation costs 50%

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By time-sharing the data from 60 or more keyboard operators simultaneously, significant savings in data station costs of as much as 50% can be achieved. Costs drop to as low as \$4300 per data station for a typical 60 station system. For large data preparation installations, the time-shared input is the only economical way to go.

Data entered into the LC-720 is processed by a small digital computer and stored on an IBM/

360-compatible magnetic disc that provides the advantages of bulk storage and high speed random access of data. The problems associated with punched card handling or the rounding, pooling, merging and unmounting of magnetic tape reels are eliminated. All data is conveniently and economically stored in an IBM 1316 disc pack for direct high speed input to your modern data processing system. Naturally, an IBM/360-compatible magnetic tape is also provided with the system as standard equipment.

The LC-720 KeyDisc System also offers for the first time, data verification requiring one input pass only through the system, in addition to the normal technique of verification requiring two different operators. Record size is infinitely variable by each operator from 1 to 120 characters, long and the system stores a large library of 30 or more different format control programs, all available simultaneously to any and all operators.

**LC-720
KeyDisc System****Bring your own data for a demonstration**

Logic Corporation invites you to see an operating demonstration of the LC-720 KeyDisc System at the company's premises. Bring your own original data and Logic will provide a reel of magnetic tape of the output of your data from the LC-720 for later printout at your own computer facility.

To arrange for a demonstration, contact Gary Tischler, Director of Marketing (201) 334-3713

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**Off-Line/On-Line
Terminal Offered**

CONCORD, Calif. — An alternative to the Burroughs TC-500 terminal computer is being claimed by Eldorado Electrodata Corp., with its new family of off-line/on-line terminals.

The terminals, enclosed in a desk-size unit, have up to 32K of core memory and lease from \$144/month, the company said. In comparing the Eldorado Computer System with the TC-500, the company pointed out that the LC's memory, at 1.1 μ sec, is 20 times faster than that in the Burroughs unit. The system can handle up to 72 peripherals and can multiplex over 50 lines simultaneously, the company said.

An IBM Selectric typewriter is used as a keyboard, and data storage is done directly onto magnetic tape cassettes or 1/2-in. standard computer tape through a converter.

The cassette units use 1/8-in. tape in 300-ft. reels. Density is 500 bit/in., with a maximum of 90,000 characters per cassette. The unit reads and writes at 400 char/sec. and rewinds the full cassette in 45 sec.

The software with the system includes a built-in loader, a debug and operating system, a two-pass assembler, diagnostics, and a demonstration program for payroll, inventory control, auditing, accounts receivable/billing, invoicing, and data acquisition.

The company's offices are at 601 Chalmers Road.



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The Other Computer Company:
Honeywell



Graphics Unit for On-Line Interactive Operations

MINNEAPOLIS, Minn. — A graphics terminal for use in on-line interactive computer operations where output must be displayed in graphic form has been developed by Control Data Corp.

Called Grid (graphic remote integrated display), the terminal receives input by means of a light pen, alpha-numeric keyboard, or function keyboard. According to CDC, display time for the graphic terminal is about 1/50 of a second.

The terminal can be operated in a remote location interconnecting with a central computer by means of telephone lines. A standard interface unit is included with the Grid system to allow use of either voice grade, low speed, or wide band, high speed lines, the company claims. A channel interface to a CDC 3000/6000 series channel is available for local use of the system.

The CDC Grid 240 series graphics system has its own pro-

cessor with a 4K, 12-bit memory that can be expanded to 8K or 12K through standard options. Any system can be used as the central processor, according to CDC.

The price of Grid is around \$70,000 (with a 4K memory) and lease price is around \$2,000/month. Delivery is 60 days, CDC says.

Control Data Corp. is located at 8100 34th Avenue South here.



Graphic Remote Integrated Display Terminal

Programmable Data Terminal Combines Remote and In-House Capabilities

NORTH SYRACUSE, N.Y. — A programmable data terminal that combines the features of a small computer with those of a terminal is being offered by Daelus Computer Products Inc.

The self-contained Model 711 programmable data terminal (PDT) is designed for remote use and is capable of working directly with a central processor. The unit "can be programmed to edit or verify entries as they are entered from the keyboard," stated Donald J. Jeffries, national sales manager of Daelus. "This is accomplished at the terminal site without any additional equipment or optional accessories."

The unit has over 30 instructions in its repertoire — an alpha-numeric keyboard, a 12-key pad, eight function keys, speed-printer unit, a magnetic tape unit, and modem and core memory.

Data transfer rate of the device is 100 char/sec. The 4K core memory is used for storage of both program and data information. The printing unit is capable of a 30 char/sec. printout on multipart forms up to 147/8 in. wide.

Production delivery of the 711 terminal is scheduled for December. Formal prices have not yet been announced but are expected to be under \$11,000, according to the company.

The company's address is P.O. Box 248 here.



Data Terminal

Carrying Case Stores 4,000 IBM System /3 Cards For Transport

PALO ALTO, Calif. — A carrying case is being offered to store IBM System/3 cards during transport.

Tab Products Co. produces the case in high-impact, rugged plastic with dual follow-blocks, a capacity for 4,000 cards, and a locking cover. The cases are designed for nested stacking and

feature a recessed "card holder." Tab Products Co. is located at 2690 Hancock Street.



Card Carrying Case

Mini Pak-Rak Holds Disk Packs

MINNEAPOLIS, Minn. — A disk pack storage unit, the Mini Pak-Rak, is being offered from Kapko, Inc.



Mini Pak-Rak

The unit can store two 2316-type disk packs on top of a computer disk drive. The 2314-type drive will hold eight Mini Pak-Raks which will store 16 disk packs.

The unit has a 16-gauge steel cabinet and features a non-skid base and a choice of four computer-coordinated colors. The unit measures 17 in. by 17 in. by 12 in. high.

Kapko Inc. is located at 7615 Metro Boulevard.

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**INFORMATION
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Specialist Matched To Client's Needs With Retrieval Technique

NEW YORK CITY — A computerized system has been developed for matching available manpower with defense and space projects.

The system, called personnel expedited retrieval technique, has been devised by Consultants and Designers, Inc., a service organization specializing in technical and scientific staffing on a temporary and semi-permanent basis.

The system helps manage a "pool" of some 30,000 technical specialists, scientists, engineers, designers, draftsmen, and other support personnel. Among the agency's employers are NASA's Apollo program and the Defense Department.

The company has developed a system that permits specialists meeting the basic requirements of clients to be selected from the file almost immediately. To achieve this the computerized procedure catalogues personnel on file so that skills are isolated

and readily discernible.

Each employee's resume information is transferred to magnetic tape by means of a punchcard that contains the applicant's name and address, telephone number, job categories, years of experience, degrees, employment status, clearance, geographic preference, previous jobs and pay rates.

The magnetic tape file is coded, first by occupation and then by category. For instance, engineers are classified under 20 different categories, or specialties.

When requests for employees are entered into the computer, an NCR 315, all the information stored on the magnetic tape is searched and the client's requirements are matched with the skills and experience of the personnel.

When a match occurs, the computer prints the name, address, and telephone number of the specialist. The office then telephones the individual to determine interest in the job.

When a position is filled, the employee goes on Consultants and Designers payroll. The company, in turn, bills its clients.

categories, or specialties.

When requests for employees are entered into the computer, an NCR 315, all the information stored on the magnetic tape is searched and the client's requirements are matched with the skills and experience of the personnel.

When a match occurs, the computer prints the name, address, and telephone number of the specialist. The office then telephones the individual to determine interest in the job.

When a position is filled, the employee goes on Consultants and Designers payroll. The company, in turn, bills its clients.



Instructions are entered into NCR 315 computer during run that will select personnel who match the needs of clients.

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Tel-Tech has taken some new and very novel approaches to data set design. The result: three Bell compatible modems that are small in size, small in price, and yet absolutely superb in performance and reliability.

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The TT-103, TT-202 and TT-201 are de-

signed to transmit data up to 300, 1800 and 2400 bps. Their compactness makes them ideal for integral terminal installations. And it doesn't take much of a rack to mount a hundred. You can also get desk-top units for stand-alone applications.

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BELL COMPATIBILITY

Tel-Tech modem	Bell modem	Speed
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TT-202	202	0-1800 bps
TT-201	201	2000-2400 bps

Auto Club Plans Tips, Insurance With Computers

DETROIT — A computer-based system is helping the Auto Club of Michigan (ACM) provide travel and insurance coverage for 878,000 members.

ACM, lone affiliate of the American Automobile Association authorized to serve the entire state, thus far this year has accumulated information for more than a half-million trips planned for its membership with the aid of an IBM 360/50. The club also insures vehicles of its members through three associated companies.

ACM uses a high-speed IBM 1287 optical reader tied to the computer to process special hand-marked forms submitted by travel counselors according to travel destination. This data is scanned by the 1287, and the resulting information recorded on magnetic tape for computer evaluation.

William Garrett, group manager for administrative and financial operations, said information gained in this manner helps the club determine favorite destinations of members and peak periods of travel.

"Last year, the club aided members in planning more than 550,000 domestic auto trips," he said.

ACM currently uses TV-like visual display units in the home office for instant inquiry into the membership and insured status of members.

The club plans soon to link its 360 system with IBM 2740 communications terminals to be located in branch offices around Michigan. Twenty-five such units — which will allow ACM to check within seconds all aspects of a member's insurance policy from nearly anywhere in the state — will be implemented by the end of next year, according to ACM.



William Pittman, assistant overseer of weaving at the Springs Mills plant, dials in a request for information at the console of the Space Craft Control System.

Production Control Data System Helps Increase Output at S.C. Sheeting Plant

CHESTER, S.C. - Putting a mini-computer at the disposal of every production worker has led to increased output at the new Springs Mills sheeting plant.

The new data processing system not only indicates his performance rating to an employee but also gives supervision minute-by-minute operating efficiencies on all of the plant's 1,368 textile machines, according to the company.

The three major components of the system are a Varian 620/i computer, a scanning and multiplexing system, and a sensing and wiring system. The entire data network for the plant was engineered by Space Craft, Inc., a Greenville, S.C., firm that spe-

cializes in applying aerospace data handling techniques to industry.

The real-time production control data system also provides machine stoppage statistics and instant signals to dispatch repairmen, production data, and production totals by shift and day.

The system, according to Space Craft, also can provide inventory control, automatic payroll computation, eliminating card punching, preventive maintenance schedules, cost accounting, and reduction in supervisory personnel allowing management by exception.

Control Words Simple

No skilled personnel are required for the operation of the equipment. All of the control nomenclature is in the everyday language of the plant.

Weavers, fixers, and set style are typical designations on the computer console. The computer programming itself is so versatile that the weave room overseers can modify it for the production of different styles merely by turning thumb wheels.

Included as part of the system are the visual displays located in

the central station and at remote units on the plant floor. Digital readout tubes display on command overall weaving efficiency for the present and the previous shifts.

Thomas Lowe, a Springs Mills overseer of weaving, reports that the display "units in the work area provide strong motivation for production workers by allowing them to gauge their own performance, not only against the entire weave-room average, but also against their fellow workers.

Another function of the computer unit is to produce reports through a 20-line-per-second printer both automatically and on command.

Excerpts of the summaries that are automatically presented at shift end or at any point during the day are: day of year; shift number; shift running time in minutes; loom group efficiency; individual machine information; group by styles with operator sets; individual loom number, number and efficiency of each individual loom with the total number of work stoppages for each, and the number of looms operating below any given efficiency level and identified by weaver or fixer.

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Bellevue Plans Health Service Improvements

NEW YORK - Thousands of underprivileged children will benefit from a computerized records acquisition, analysis, and retrieval system presently being developed at Bellevue Hospital. The purpose of the Bellevue Pediatrics Project is to integrate the widely scattered pieces of the health records of the 25,000 children presently using the hospital. It will also assist in the provision of comprehensive health services to the 35,000 other young people in the Bellevue area.

According to the hospital, medical care now given to the children of low income urban families is fragmented among large municipal hospital clinics, child health stations, school health services, voluntary hospitals and clinics, and other charitable organizations.

No one element maintains responsibility for the total health needs of the children and there is no way to determine if health services are being provided at all.

Lack of Communication

Much duplication of effort exists and there is a lack of communication among health workers at all levels. Often, problems of illiteracy and language barriers complicate communications between the patients and the medical staff.

Dr. Leo Tick, director of records retrieval for the project, explained that the system will be operational within a few weeks with the installation of a Univac 1108.

The computer will be installed at the New York University Medical Center, Communication

will be over telephone lines between the center and Bellevue, located on New York's Lower East Side.

The physicians themselves will not operate the system. Computer-acceptable data will be produced as a byproduct of their routine medical activities. This information will be handled by programmers and computer operators.

Share Information

Other health facilities such as child health stations and school health services that share in the health care of the patients seen at Bellevue will be given full assistance in the preparation of their information in computer-acceptable form. The system will eventually include means for input and retrieval of information by private physicians who may see the same pediatric patients from time to time.

The project is supported by a grant from the Children's Bureau of the Department of Health, Education and Welfare.

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Dockers Assigned to Jobs by Computer

NEW YORK—Computer terminals are now flashing on every active pier in the Port of New York to issue prior day work orders to the 22,000 registered dockworkers, thus bringing the waterfront in tune with the modern age.

Establishment of this system of advance hiring by the New York Shipping Association, under a contract arrangement with IBM, is a giant step from the days when the hiring boss picked his men at the pier head at the start of a day's work.

Hiring Agent

On each of the port's 80 active piers and terminals, the Shipping Association has positioned an IBM 2740 communications terminal which the hiring agent will use to transmit his orders for men for the following day to the Shipping Association's computer center.

This central bureau, equipped with IBM 360/50s and 65s linked to each pier and terminal by direct telephone wires, will record the hiring and also transmit back to the hiring boss any information concerning the individual's status as to both availability and eligibility for work.

In the hiring of additional labor for the following day, the hiring boss will go to the Waterfront Commission employment center where the names of men available for work will be flashed on him on a screen, similar to that of a small television set, and designated IBM 2260 visual display terminal. From these names he selects the men to be hired and registers them as ordered in for the following day. Individual orders for each man for the next day will be posted on the pier or terminal where he is working that day, indicating where he is to report for work the following morning and listing the type of job.

"The advantages of the new system are many," said Alexander P. Chopin, chairman of the Shipping Association. "All, except a handful of men, will go directly from home to the pier or terminal where ordered. This will assure the men, in advance, of a day's work and bring them to the pier at the start of work."

Pay Claims Expedited

Chopin said that in addition to placement of the IBM 2260 visual display screens and communications terminals on the active piers several have been located in the offices of the Shipping Association to provide instant answers to inquiries by Association employees respecting the eligibility of any longshoremen for fringe payments, such as welfare, holiday, vacation pay, and the guaranteed income.

"Upon inquiry concerning any individual longshoreman, the data storage master file will flash back the man's I.L.A. Local, his seniority status, his current employment record, his eligibility for welfare, vacations, and a particular holiday, his status under the guaranteed income and his home address," Chopin

said. "From this information, the Shipping Association employees can promptly process any worker's claim for pay and greatly expedite any monetary settlements for which he is eligible."

The master storage file is capable of keeping current records on all individuals. It is corrected daily by the NYSA systems and data processing staff to record all changes in pertinent information concerning each individual dockworker.

Avis Rent-a-Car Links Facilities To Space Bank

NEW YORK—Avis Rent-a-Car System, Inc., will link its facilities to the American Express "space bank" high-speed computer reservation system. It was announced jointly by Howard L. Clark, chairman and chief executive officer of American Express Co., and Winston V. Morrow Jr., president and chief executive officer of Avis.

Avis has signed a world-wide agreement with AM-EX Express Reservation Services Inc., operators of the space bank, which enables Avis customers and travel agents to reserve an Avis car anywhere in the world by placing a telephone call to a space-bank reservation center.

The Space Bank's computers, two IBM 360/40s, headquartered in Memphis, Tenn., currently provide instant confirmations for hotel and motel rooms in the U.S. and London. Additional cities in Europe, Canada, Mexico, and the Far East will be added by early 1970.

Over a quarter million rooms, representing participating hotels and motels, are presently linked to the space-bank by their own terminals or through AM-EX Express Reservations' centers.

Toll-free telephone calls can be made to the reservation center by a traveler or travel agent from anywhere in the U.S. requesting an Avis car or hotel reservation. The reservation clerk takes the necessary information (name, date of arrival, days car needed, etc.) and feeds it into the reservation terminal. Within seconds there is a confirmation.

The space bank went into operation on Nov. 15.

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Stacked . . . But Not Sorted

A group of data processing students recently formed an organization at Northern Arizona University (NAU) in Flagstaff and held a beauty contest to publicize their club and draw the attention of prospective employers. They can hardly be blamed if the winner, Miss Katha Kline, a 19-year-old sophomore, fails to attract the desired interest.

NAU's four-year EDP program now produces about 20 graduates a year.



"Total Involvement" Characterizes CDC Approach to Successful Slum Production

MINNEAPOLIS — Control Data Corp. is using the personal approach to show that it's possible — and profitable — to set up operations in a slum area using local labor.

The company's North Side plant, purposely set up in a poverty area, goes out of its way to show its employees — including welfare mothers, ex-convicts, and high school dropouts — that it is sincere and that they are vitally needed.

Keeping in mind that altruism couldn't be tolerated as an excuse for the production of faulty computers, company officials developed an employee-training program and benefits package aimed at boosting morale and

motivation. North Side officials term it a "total involvement" approach that offers an employee program suited to solve those problems that might lead to absenteeism, production errors, and failure.

Included are a counseling program, day-care facilities, liberal dress rules, legal-aid assistance, intensive on-the-job training, monthly "communications" meetings, regular employee evaluations, medical assistance, and a variety of skilled and semiskilled jobs from which to choose.

North Side offers a 22-week training program. In-class sessions take one week; 28 hours are spent on skills training.

New employees are introduced

to the basic hand tools and are slowly advanced through the more intricate controller operations.

Trainees, in a 2-1/2 hour session the first day, learn to eight-color code for wiring 6,000 feet of power wiring in a controller chassis. By the fourth-day, they are wiring tiny resistors onto logic plates.

Hour-long motivation sessions take up another seven hours. There, the trainees probe job-related topics ranging from the effects of gossip to the importance of being on time.

Corporate attorneys and financial counselors hold advice classes for the trainees, instructing them on how to deal with contracts, leases, credit, and accident suits.

In addition, Minneapolis school officials conduct night classes at the plant for those who want to get a high school diploma.

And, the company has no qualms about second-guessing itself, particularly where programs are concerned, and then making changes for better mutual return.

About six months ago, officials discovered that the plant was suffering from the usual slum-plant woes — production problems, low morale, absenteeism, and increased turnover — and a change was begun immediately.

Workers were given a larger voice in company affairs, new employee services were added, existing ones were expanded. The plant began offering more than simply assembly-type jobs.

Employees are evaluated quarterly for promotions and salary increases. Of the six left from the first training program of 10, three are now plant foremen, and all six have had at least two raises.

Manpower officials gauge a slum plant's success upon plant productivity, absenteeism and turnover rates, employee morale, and profits.

Control Data's plant has a relatively low absentee rate and a turnover rate of 6% monthly. Its production is on schedule, and orders for computer units are being completed on time.

"We needed these people to survive competitively," says Norbert Berg, vice-president for personnel services, who views the North Side operation as a vital link to untapped manpower resources.

U.S. Department of Labor officials and manpower training experts across the country have been watching the North Side plant, like what they see, and regard it as a good model for other firms to follow.

Critics contend that Control Data's North Side undertakings are too expensive, based on the firm's admission that by 1971 it will have spent more than \$6 million on it.

However, the firm estimates expenditures of only \$2,500 per trainee, a figure far below the \$3,000 average for trainees in federal job programs.

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Placement Agency Trains Programmers; 50% Hired

NEW YORK — A college degree and a high score on a programmer aptitude test, usually considered big selling points for prospective programmers, failed to attract job offers even at the trainee level for about half of 19 graduates of a programming course offered recently here.

Data-Tech, a computer personnel placement agency, screened some 200 degree-holders from varied curricula by interviewing and testing prior to selecting 25 for enrollment in a free, seven-week evening course in programming. The class met four nights a week for sessions of three to four hours each.

Of the 25 participants, 19 completed the course, having written several Cobol programs. Data-Tech district director Jim Delmar explained the nearly 25% dropout rate saying, "It was such an intensified course that a lot of people couldn't shake free for the four nights a week. That's a pretty good grind."

"All the people were working during the day, nine to five. . . A lot of people dropped out

because, once you start minding one or two classes a week, you're too far behind."

Also complicating the picture, he said, was the poor timing involved in putting applicants on the job market in the middle of the summer.

No firms rejecting candidates cited the relatively short training period as a factor.

Delmar felt, however, that the technically oriented recruits were much more likely to hire than were those selected at random from a firm's personnel office.

He cited an applicant's verbal ability to sell himself to an employer as a common key factor among those who found jobs.

He said that Data-Tech had originally hoped to place between 90% and 95% of students by being fairly selective at the outset. Because the firm makes a fee by placing the graduates, he summed up by saying that the project had been "very favorable from the students' point of view, but not so much for us."

Hardware Mock-Up Provides Hands-On Experience Without Machine-Time Cost

NEW YORK — A package designed to teach fundamentals of computer operation by simulating the control panel of an IBM 360/30 has been developed by Programming Sciences Corp. (PSC), a software services firm.

Central to the training is the 60-bus Eduputer unit, equipped with markings, dials, switches, and other features similar to those of the 360/30, according to the company.

The Eduputer is accompanied by a set of instructional material, including a cassette recorder, 16 taped lectures, a course outline, and student and instructor guides.

According to Alan Epstein, the Eduputer's inventor and director of PSC's educational services division, the program is aimed toward the tenth-grade level and requires no previous knowledge of data processing. He estimates that an average pupil should complete the training program in "between 35 and 40 hours."

Operator Interplay

The student first learns methods of console operation from the lectures and workbooks. He then practices them on the console.

The operator may be asked, for example, to display "Location 5000." The exercise to be performed requires that data 5A for example, should also be displayed. If the student goes through the main storage display

procedures correctly, 5A will appear in the main storage data register and 5000 will appear in the main storage address register when the display button is pressed.

If the student has erred either in operating method or addressing, the console display registers remain blank. Data at particular addresses is changed from exercise to exercise to avoid rote learning.

Not Real Computer

Only predetermined operations and results can be performed, and the Eduputer is in no way PSC stress, an actual computing device.

PSC cites avoidance of machine-time expense and the individual, reusable nature of the training among the system's advantages.

Price of the entire package is

\$3,600, according to Epstein, with the Eduputer unit alone costing \$2,950. Quantity discounts will be available to non-vocational educational institutions, he said. A leasing plan from \$200/month is also available, according to the firm.

Primary markets for the package, the company believes, are nearly 6,500 business and government installations using the Model 30; secondary schools offering vocational courses in computer operations; and data processing schools.

PSC intends to develop additional models to simulate the 360/40, 50, and 65, according to Epstein, who also noted that the firm would consider developing units to match the hardware of other manufacturers.

Initial deliveries are scheduled for January.

Analog/Hybrid Use and Potential Explored in EAI Audio-Visual Kit

WEST LONG BRANCH, N.J.

An audio-visual slide presentation entitled "Understanding the Analog/Hybrid Computer" has been released by Electronic Associates, Inc. here. Designed to explain the basics of analog and hybrid computers in a simple and concise manner, the kit emphasizes ways in which analog and hybrid systems are currently being used, their

possible future applications, and distinctions between them and total digital systems.

The package, priced at \$100, is suggested for classroom or meeting use. It consists of a 32-minute audio tape, eighty 35mm color slides, and a presentation guide.

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Three-Day AMA Conference Focuses Upon Unbundling Computer Support Services

NEW YORK — A three-day conference entitled "Unbundling Computer Support Services: Effects on Your Systems Cost Strategy" will be presented by the American Management Association (AMA) Dec. 1-3 at the New York Hilton Hotel.

The format includes lectures, question and answer sessions, and round table "shirt-sleeves" discussions by the registrants.

Among the featured presentations are:

"Effects of Unbundling on the Software Industry," Robert Kassel, vice-president, Computer Sciences Corp., Los Angeles.

"Unbundling and the Data Processing Service Center," Joan Van Horn, president, VIP Systems Corp., Washington, D.C.;

societies

"Developing Alternatives to Computer Manufacturers' Educational Services," William K. Cool, director of operations, MIS, Reynolds Metals Co., Richmond, Va.;

"Developing a Corporate Cost Strategy in an Unbundled Environment," Arthur Nessi, manager, computer planning and control department, Ford Motor Co., Dearborn, Mich.;

"The User's Responsibility in Evaluating Competitive Software," John McNeely, manager,

systems evaluation, Scientific Resources Corp., Montgomeryville, Pa.;

"Evaluating Independent Maintenance against Systems Support Services," Frederic G. Withington, senior consultant, Arthur D. Little, Inc., Cambridge, Mass.;

"Taxation of Software: Implications and Costs," Robert P. Bigelow, attorney, Edwin A. Keler, chief, technical and uniform audit function, Internal Revenue Service, New York, N.Y.; and Nicholas Anje, group supervisor, Internal Revenue Service, Buffalo, N.Y.;

"Special Considerations in Systems Engineering Contracting," Arthur S. Liss, manager, technical service group, Arthur Anderson & Co., New York, N.Y.;

"The New Environment and Its Effects on Hardware Selection," Frederick C. Ihler, president, Comtext Inc., Rockville, Md.;

"The Leasing Companies in a Changing Environment," Paul W. Williams Jr., president, Booth Computer Corp., San Francisco.

Cost of the conference is \$200 for AMA members; \$235 for nonmembers. Preregistration for the program, No. 6301-01, is recommended. AMA headquarters are at 135 W. 50th St., New York, N.Y.

ACM Offers Two Communications Seminars in D.C.

NEW YORK — Two December seminars in data communications will be offered by the Association for Computing Machinery (ACM) in Washington, D.C.

Data Communications I, Dec. 9-10, is a foundation survey developed by Price Waterhouse & Co. ACM says the seminar will discuss the "technical realities of data communications with attention to their effect on system design, new software development, management control, FCC tariffs and other regulations, and economic trade-offs."

The second offering, Data Communications II, is an intermediate seminar developed by Contemporary Systems Corp., Bethesda, Md.

Scheduled for Dec. 11-12, it is designed to give experienced computer analysts insight into the task of data communications system design. ACM says it will highlight many of the potential pitfalls of implementation and will attack such planning problems as determination of service requirements, selection of hardware, controls adequate to prevent loss or destruction of data, and evaluation of manufacturers' proposals and software packages. Registration and accommodation information, fee schedules, and additional information is available from the ACM at 1133 Avenue of the Americas, New York, N.Y. 10036.

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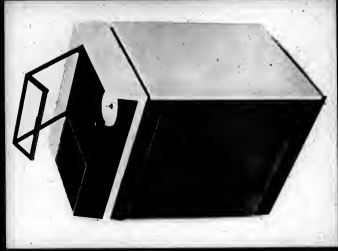
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Speed has always been the underlying goal in the history of computers, beginning with the use of the ancient abacus thousands of years ago. Speed prompted a teenage genius, Blaise Pascal, to develop the first calculator as early as the 17th Century. Speed was increased when the first electronic computer was developed in 1947, and is still the goal today.

Very simply, each new development has spawned more developments, erasing contemporary stan-

dards, setting even higher goals, allowing even greater advances.

The ISS 714 is the latest of these advances. The contemporary industry standard for average access time to an eleven-high disk pack was 75 milliseconds—with the 714 it's 32 milliseconds. Standard start-up time was 60 seconds—now it's 20 seconds. Improvements like these are based on reliability and serviceability as well, providing the most advanced disk storage drive available on the market today.

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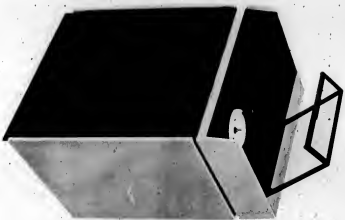
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Track-to-track	10 ms
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Maximum	60 ms
Start-Up Time	15 sec
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Data Transfer Rate	156,000 bytes/sec
Operating Environment	60 to 90 °F 8% to 80% RH



Specifications 714 DISK STORAGE DRIVE

Access Time	
Track-to-track	10 ms
Average	32 ms
Maximum	60 ms
Start-Up Time	20 sec
Storage Capacity	29 million bytes
Disk Speed	2400 rpm
Number of Heads	20
Number of Disk Surfaces	20
Data Transfer Rate	312,000 bytes/sec
Operating Environment	60 to 90 °F 8% to 80% RH



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H.M. Kelsey Jr., president of Talcott Computer Leasing, is shown the new Talcott 9311 disk drive by Friden division officials, C.V. Meyer, vice-president — advanced systems operations, and R.J. Campbell, president.

Singer-Talcott Disk Deal Looks Like \$15M by 1971

NEW YORK — The Friden division of the Singer Co. and the Talcott Computer Leasing division of James Talcott, Inc. have announced plans to offer computer users a computer storage device they claim can save up to 50% over the most commonly used competitive unit.

The agreement, which could involve over \$15 million of equipment by the end of 1971, calls for Friden to manufacture, market, and service the new disk drive, and for Talcott to lease the unit, designated the Talcott 9311 disk drive, according to Presidents Robert J. Campbell of Friden division and Harvey M. Kelsey Jr. of Talcott Computer Leasing.

The new disk drive features an electronic servomechanism that contrasts with the hydraulic

system used in disk drives of other major manufacturers. The servomechanism has fewer parts, resulting in greater reliability and lower manufacturing costs, according to Friden officials.

The lower lease rates to be offered by Talcott flow directly from these reduced manufacturing costs, Campbell and Kelsey said.

The 9311 unit was developed by Friden and will be manufactured by the Friden division at its advanced systems plant in San Leandro, Calif. Monthly lease rates were set at \$400 for a one-year contract, \$375 for two years, and \$335 for three years. The rates include maintenance by Friden's nationwide, factory-trained customer service organization, and there is no charge for extra shift use.

Prudential Bid for CTI Control Off-At Least for the Present

By A.B. Williams

While it's too early to say that the acquisition of computer-related companies by major national organizations has become a wave, or that the wave is ebbing, one such transaction has been called off for the second, and presumably final, time.

Prudential Insurance Co. of America, one of the largest insurers in the world, and LTV Aerospace Corp., one of the most important pieces of the Ling conglomerate structure, have ended negotiations for the sale, by Ling, of its 71% interest in Computer Technology Inc.

The insurance company's negotiations with LTV Aerospace and CTI had apparently included a premise whereby CTI would have been in charge of a merged computer conglomeration in which Prudential's hardware would have been about one generation behind that of CTI, ac-

cording to an estimate by a high officer of Prudential.

This and other factors are said to have been responsible for the projection that their equipment could not have been combined with CTI's facilities management network on terms that assured Prudential of a reasonable cost and a profit to CTI.

Generation Gap

The statement concerning the "generation gap" is quite interesting in that Prudential has historically been a major user of IBM equipment. Their computer facilities are said to consist largely of third generation hardware, including a large number of System/360s, ranging from Model 30s to 65s.

These are certainly third generation machines, and the industry hasn't labeled anything as fourth generation.

The gap could be explained by the use of substantial 360 time

in emulation of second generation production programs, such as billing runs, sort-and-print, etc. This would not represent an attractive use of CTI's time-sharing facilities management operation. A Prudential spokesman said that his company has made excellent progress in a planned rewrite of all old programs.

Other conjectures are that both Prudential and IBM might possibly have lost some, or eventually all control of the huge hardware investment, which is said to include over 30 System/360s in Prudential's Newark headquarters alone, plus 20 or 25 in other locations, and a few 1401s and 705s.

This is substantial, and both Prudential and IBM have benefited greatly from close cooperation over the years.

The negotiations involved about 71% of CTI's stock, below the 80% ownership necessary if Prudential were to want to merge CTI.

From Great Oaks Do Little Acorns Grow



The IBM Federal Systems division building, recently completed at Westlake, Calif.

WESTLAKE, Calif. — IBM's Federal Systems division building, a contemporary, three-story concrete and steel structure described as an "architectural challenge in flexibility," is completed at the Southland planned community of Westlake.

The 130,000-sq-ft facility houses engineering laboratories, a computer center and office areas. Its main interior partition system is moveable and can be rearranged to accommodate new offices.

ADR Report Reflects Programmatic Loss

PRINCETON, N.J. — Applied Data Research, Inc., computer software and service company, reported revenues for the third quarter ended Sept. 30, 1969 of \$1,610,336 and earnings of \$75,366 or 8 cents a share based on 968,828 shares outstanding. This compares with revenues of

\$1,261,720 and net earnings of \$90,291 or 10 cents a share, based on 944,782 shares outstanding, for the similar reporting period in 1968.

For the first nine months of 1969, the company reported revenues of \$4,656,131 and net earnings of \$152,891 or 16 cents a share, compared with revenues of \$3,307,735 and net earnings of \$208,110 or 23 cents a share for the nine-month period in 1968.

The figures for both compa-

rative periods have been adjusted to reflect the third quarter acquisition of Programmatic, Inc., whose revenues and net loss for the first nine months of 1969 are reported with Applied Data Research on a pooling-of-interest basis.

Richard C. Jones, Applied Data Research president, said that because of Autoflow, the company's leading proprietary software program, with about 900 installations, continue to meet earlier sales projections.

Vermont Research Stock to Split

NORTH SPRINGFIELD, Vt. — The board of directors of Vermont Research Corp. has decided to submit to the shareholders of the corporation at their annual meeting a proposal that the \$5 par value shares of the corporation be split on a 10-for-1 basis.

The record date proposed for the split is Dec. 15, 1969.

Sales Up, Earnings Off at Levin

NEW YORK — Gross revenue of Levin-Townsend Computer Corp. increased for the first six months of fiscal 1969. Gross revenue increased to \$33,312,572, from \$22,993,380 for the comparable six months

of the prior fiscal year.

Net income for the six months ended Sept. 30, 1969 was \$3,884,690, or \$1.04 per share, compared to \$5,196,789, or \$1.52 per share for the six months ended Sept. 30, 1968.



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IRC Elects Kuemmerle President

NEW YORK — John F. Kuemmerle has been elected president and also a director of Installations and Research Corp., a New York City-headquartered electronic data processing company that offers a computer output microfilm system for the conversion of data information directly from magnetic tape to film.

Prior to joining Installations and Research, Kuemmerle was a vice-president of the J. Henry Schroder Banking Corp. and the Schroder Trust Co. Previous to that he was a director of systems and data processing for the American Express Co., and a corporate manager of systems at Merck & Co., Inc.

He is on the board of directors of Northwest Electronics Co., and St. Anthony Printing Co.

Borja Named Gen. Mgr. Of Univac in Brazil

PHILADELPHIA, Pa. — Carlos F. Borja Jr. has been appointed general manager of Univac Brazil, a division of Sperry Rand Co. Brazil.

He will be responsible for the marketing and servicing of all Univac products in Brazil, with headquarters in Rio de Janeiro.

Prior to assuming his new post, Borja was chief of the industrial development and intermediate credit division of the Agency for International Development, U.S. Department of State in Brazil, with responsibility for supervising all industrial development loans from the U.S. Government to Brazilian industry.

Previously, he was deputy attorney general in the Department of Justice, State of California; zone manager in Brazil for the Ford International Co., and a sales and advertising executive in Latin America for the

Executive Corner

Firestone International Co.

□ Paul Sternberg has been promoted to president of Data Systems Applications, Inc., a wholly owned subsidiary of International Industries, Inc., Beverly Hills, Calif.

□ Computer Sciences Corp., Los Angeles, has announced the appointment of David A. Woellner as director of New York operations for the systems division. Woellner will direct the systems-oriented services that Computer Sciences provides to commercial and industrial organizations in New York City, the middle Atlantic states, and New England.

□ Guillermo Perez has joined DMC Inc., Oak Brook, Ill., as senior associate of research planning.

□ Dave Jones has been appointed vice-president and general manager of Caelus Memories, Inc., San Jose, Calif. In his new position, Jones will be responsible for directing and coordinating the activities of all departments within the company.

□ Daniel Lecht has been appointed vice-president of Advanced Computer Techniques Corp., New York. Lecht is also, Rhode Island Lithograph Corp. of Pawtucket, R.I.

□ Computer Communications, Inc., Inglewood, Calif., has announced the appointment of Robert Taggart as director of operations of their Minneapolis system center. In his new capacity, Taggart will be responsible for all systems support in the upper midwestern states.

□ Fabri-Tek, Inc., Minneapolis, has named William C. Lahti to the post of general manager of Fabri-Tek Computer Components, headquartered in Blantyre, Scotland. He will have responsibility for all sales, service, manufacturing, and engineering.

□ Information Standards, Inc., New York, has announced two personnel additions. Larry Krassner, formerly vice-president, marketing for strategic datacenters, has been elected executive vice-president. Alan Gottlieb, formerly manager of programming at DMS Computer Software, Inc., has been appointed director of systems.

□ Federal Scientific Corp. of New York has announced the appointment of Joseph H. Flunk to the new position of vice-president for computer analysis. He will head a group of computer programmers and system engineers responsible for ubiquitous analysis/computer systems integration and contract signal processing.

□ David Chertkov has been named engineering manager of the PDP-8 line of small computers of Digital Equipment Corp., Maynard, Mass. He will oversee the engineering activities of the computer group and develop options and peripheral equipment for the PDP-8 family of small computers.

□ The new chief of staff for the electronic systems division of the Air Force Systems Command, Hanscom Field, Mass., is Col. Charles G. Johnson, formerly chief of the division's field office in Bangkok, Thailand. He replaces Col. John P. Clewry, who has been reassigned to the Military Assistance Command, Vietnam.

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Group 128 Underway to Provide Optical Design and Production

WALTHAM, Mass. — "Almost every new device in the computer field depends on optics," said Eric Grubinger, president of Group 128, Inc., a new company in high-precision optics.

The company has been formed to provide optical design and production to supplement the electronics capabilities of computer manufacturers.

Examples of optics requirements are in character recognition, mark sensing, pattern matching, microfilm, microfilm, laser storage, holography, plasma panels, and typesetting. Grubinger was director of terminal planning for Honeywell prior to his present position.

"We have already achieved a sales volume large enough to convince us that computer-related optics is a very promising market," he said.

Other New Companies

• **Computer I/O, Inc.**, a complete OCR service bureau, has been organized in Houston to provide services to the growing Texas Gulf Coast area through its optical scanning equipment. Heart of the system is a CDC 915 page reader. With this equipment and a CDC 1700, Computer I/O will scan input data and return magnetic tapes or other input media for its customers to process on their own computers.

• **I/O Data Systems Corp.**, Oakland, Calif., will provide customized software and a complete line of computer services to business and industry.

Areas of specialization are bill of material, inventory control, and financial applications.

A completely integrated accounting system including accounts receivable, accounts payable, payroll, profit and loss, and general ledger is currently available.

• **Space Applications Corp.**, organized in Los Angeles, specializes in aerospace engineering, analysis, and software.

Space Applications' staff has extensive experience in satellite ground support software, orbit determination and trajectory analysis, and real-time computer systems.

The company has also entered the field of business applications, providing proprietary packages and programming and consulting services.

• **Computer Data Enterprises, Inc.**, Jenkintown, Pa., is a new company whose goal is "total data processing systems for business, government, and social programs."

CDE is preparing to handle complete problem areas. In addition to evaluating a customer's needs and implementing them with computer programs, CDE plans to market, install, and maintain its programs.

• **Simulation Associates, Inc.**, has been formed to provide education, software, and consulting across a broad spectrum of simulation techniques and applications.

Philip J. Kiviat, president of Simulation Associates, is the author of two simulation languages, Simscript II and Gasp.

The company is located at 1263 Westwood Boulevard in Los Angeles.

• Two data processing organizations have joined to form a teleprocessing computer utility in the "tri-state" area and one of the largest in the nation in the field of savings association data processing.

The new company combines the resources of Tele-Accounting Bureau Corp., subsidiary of Ohio Valley Financial Corp., and Cen-

tury Data Processing, a division of Wabash Consolidated Corp.

The new Tele-Accounting Corp. of Cincinnati, Ohio, handles 11 savings associations having more than three-quarters of a billion dollars in assets.

The company serves two insurance companies, four insurance agencies and a major national construction company.

Tele-Accounting also offers programming and systems assistance and will be entering the time-sharing computer utility field in the near future.

• **Systems, Inc.**, a new electronic data processing consulting firm has opened offices in the Weber Building, 9420



COMPUTERWORLD

emerging enterprises

Defense Highway (MD 450), Lanham, Md.

According to President Stephen Burkard, the company offers its clients a complete package of data processing services.

• **Ocean Data Systems, Inc.**, Bethesda, Md., has commenced operations to serve the data management and computer software needs of the marine community.

ODSI will specialize in improving the accessibility of marine information required for planning and investment, research and development, and operation-

al decision making.

Specific plans include developing advanced marine data processing systems, improving marine data products and services, enhancing use of coastal zone resources, strengthening policy planning in marine affairs, and broadening marine environmental prediction services.

Programs are now being developed to provide environmental support services to the oil industry, including sea ice forecasting for Arctic operations.

Dr. Jerome Morenoff is president of the firm located at 4715 Cordell Ave.

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WHO IS USING IT

The service has been successfully used by major insurance companies, banks, brokerage firms, manufacturing companies, and major service bureaus throughout the United States.

Satisfied users include Firemen's Fund Insurance Co., Crown Central Petroleum, FMC Corporation, Connecticut Savings Bank, James Talbot, Inc., Dominick-Dominick, Tractor Computer Corporation, and the largest service bureau corporation in the United States, among others.

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Excellent documentation. The user automatically receives a complete set of documentation along with his source and object 360 programs as a result of the CONVERT-A-CODE SYSTEM. This documentation includes parallel 1401 and 360 listings, op code cross-reference listings, a data map describing constants, and other materials. Compiling the 360 program will also automatically, of course, give you a 360 label cross-reference as well as various symbol table references. If your installation has an automatic fourcharacter you can also generate a complete fourcharacter for each 360 program. Thus, a complete set of documentation has been generated automatically. In many cases this serves to protect a significant investment in 1400 series programs which have lacked such documentation.

The CONVERT-A-CODE SYSTEM works from object decks as well as source. It can handle patched programs or 1401, 1440 or 1460 series programs of any language.

The CONVERT-A-CODE SYSTEM works. The CONVERT-A-CODE SYSTEM has achieved proven success in sophisticated installations throughout the country. You have the opportunity to achieve a 100% successful conversion and avoid all of the pain and aggravation typical of such work . . . at less than in-house cost in less time. Before you need make any commitment we will give you a firm written bid in time and dollars. If this approach interests you, why not ask us to submit a bid.

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Contracts

Univac's Federal Systems division has received a \$1.35 million contract from the Naval Ordnance Systems Command for production of Mark 152 (Univac 12198) computers to modernize the Tartar and Talos missile control systems. Production will be at the St. Paul, Minn., facility.

The Jacobs Co. of Chicago has selected Planning Research Corp. of Los Angeles to assist with research being conducted for the Department of Housing and Urban Development's Office of Small Town Services. The study will concentrate on an evaluation of the needs of small communities and the role of HUD programs in meeting these needs.

The North American Air Defense Command has contracted RCA in the amount of \$150,000 to program the computers located in Norad's underground headquarters near Colorado Springs. These computers instantly process and display data received from missile warning radars and other sensors strategically located around the world.

The University of Cincinnati has contracted Applied Dynamics for an \$184,000 analog/hybrid system. In operation, the new system will utilize an Applied Dynamics/Four general purpose analog/hybrid computer interfaced with an IBM 1130 digital computer supplied by the

University.

Datamate Computer Systems, Inc., a subsidiary of Siboney Corp., has received a \$26,200 contract from the National Aeronautics and Space Administration for Nasa's Goddard space flight center in Greenbelt, Md. The contract involves Datamate's Model 16 compact computer, which will be used in a telemetry system to provide real-time data reduction and reformatting.

Ozark Airlines, Dallas, has entered into an agreement with Mutual Computer Services, Inc. for MCS' shared airline reservation system (Share) that provides computerized reservations, message-switching, and other

real-time services.

Intellectron International Inc. will supervise the construction and equipping of a multimillion-dollar computer center being built by Republic Corp. of Los Angeles. The center adjoins Intellectron's computer facility, and Intellectron intends to lease computer time from Republic on the new equipment.

Sanders Associates Inc. will supply their 720 electronic data display systems to Planning Research Corp. for an automated reservation system that provides users with instant rate, availability, and other information on more than 130,000 hotel and motel rooms located throughout the country.

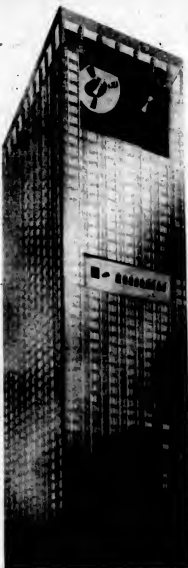
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Lockheed Plans Diversification; Forms Computer Service Section

REDLANDS, Calif. — In a diversification move, Lockheed Propulsion Co. has formed a special computer services section to offer data processing services to outside organizations in southern California.

Firms throughout the area will now be able to draw on the firm's computer services department in both business systems and the design, development, and production of advanced solid propellant rocket systems. The services range from basic keypunching to total programs individually tailored to a user's specific needs.

A specialized medical billing program is currently in operation.

The staff at the Lockheed facility operates a fully equipped computer center which includes an IBM 360/40 plus a GE 635 that is interlocked with a Honeywell 120.

Other New Subsidiaries

★ A new division devoted to the marketing of software packages has been formed by Applied Computer Sciences, Inc.

ACS, with offices in Hartford, Conn., and Providence, R.I., provides data processing management consulting, systems design, and computer programming services, primarily to the financial and manufacturing industries.

The software packages will be oriented primarily towards the financial industry for use in the customer services area and for manufacturing companies in the production and inventory control areas. The packages will be developed by participating banks, client organizations and by the

company.

★ Computer Conversions, Inc. has formed a new franchise business systems division, which will specialize in the design and implementation of integrated business systems for franchising companies.

The new division will provide a full range of systems consulting services covering the analysis, design, programming, and installation of manual and/or automated business systems for the client franchisors, and, if desired, their individual franchisees.

★ A new federal systems division to provide highly technical computer programming services for governmental agencies, busi-

ness, and industry has been formed by Norvell Systems, Inc. of Memphis.

Operation of the federal systems division will be directed by Gene Patterson, a native Memphian who holds degrees in engineering physics and industrial management from the University of Tennessee.

★ The Signal Companies, Inc. entered into the computer/microfilm field through a majority interest in a new subsidiary, Data Dissemination Systems, Inc.

The new company will provide computer/microfilm systems for a wide variety of end users: DDSI will offer overall system



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capabilities including both software and hardware.

★ Information and Communication Applications, a computer software firm, has established a communications division to give its clients technical services essential to the design, programming, and operation of any type of message or data computer-controlled communications system.

The division provides a single source for data gathering transmission, and processing.

★ Auerbach Corp. and Comprehensive Designers, Inc., both headquartered in Philadelphia,

have started a new company, CompData Services Corp., to engage in facility manning and manpower assistance for the computer and software industry.

CompData will fill specific requirements for competent data processing personnel created by the accelerated growth of computer technology. CompData, to be headquartered in Philadelphia, will staff computer processing facilities for its clients and supply on a large volume basis systems analysts, programmers, coders and related personnel to meet peak manpower requirements.

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Orders and Installations

The Belgian Post Office has purchased a large-scale optical character recognition system for direct reading of payment documents for all accounts in the Post Office-operated Giro organization. The equipment was ordered from Recognition Equipment France, S.A., Paris-based subsidiary of Recognition Equipment Inc. of Dallas.

A Univac 1108, which will make data processing available to the entire university community at the State University of New York in Albany, has been installed in the S.U.N.Y. computer center.

Data Processing, Inc., a Jacksonville, Fla., computer service organization, has purchased a

Honeywell 2200 for installation in their new offices in the Gulf Life Tower.

S. Klein Department Stores, New York, has purchased a 3360 tape-to-tape translation system for the Univac 111A to IBM 360 from SYS Associates, Inc. of Fort Lee, N.J. This is the second unit for Kleins and will be installed in their computer center in New York City.

Manhattan Life Insurance Co. has ordered its third GE-225 information system to improve service to about 185,000 policyholders. The GE systems perform tasks ranging from payroll to stock transfers.

The Fluor Corp. in Los Angeles has ordered a GE-Pac 4020 process computer for installation in a nuclear fuel recovery plant on a closed-loop control application.

The following customers have purchased NCR Century 100 systems: Michael Bruckner AG, Hagen, Germany, to handle this grocery concern's general office functions; a Merican University, Cairo, Egypt, for administrative chores; Fukui Vinyl Kogyo Co., Ltd., Fukui, Japan, to handle this plastic waste manufacturer's general office procedures; and Hothman's Tobacco Co., Ltd., Napier, New Zealand, for inventory procedures.

NCR Century 200s are being used by the Banco Iquique of Madrid and Bank Omran in

Tehran, Iran, to process accounts; the Guardian Building Society, London, to handle mortgage and investment accounts; A/S Jydsk Data Center, Vejle, Denmark, to enhance their data processing capabilities; and Bertels N.V., Rotterdam, Holland, to process in mail order house transactions.

Automatic typesetting systems using Digital Equipment Corp.'s PDP-8/L have been installed in Belfast, North Ireland, and in the English cities of Coventry and Croydon.

Atlantic Software Inc. has received orders for the Score package from Lees Carpets, a division of Burlington Industries; the U.S. Dept. of Agriculture; and U.S. Dept. of Housing & Urban Development. Score, operational at 60 sites in the U.S. and Canada, now includes file management capabilities.

Squibb Beech-Nut, Inc., New York, will use Foresight, a financial planning computer program, in its corporate planning and budgeting operations. Software Services Inc. markets Foresight.

Franklin National Bank will install a "talking" computer, developed by IBM, to handle its customers' checking accounts. Using an IBM 360 in conjunction with a 7770 audio response unit, tellers will tap a customer's account number into a Touch-Tone telephone to update a cus-

omer's account or inquire about its current status.

Jones & Laughlin Steel Corp., Pittsburgh, Pa., has ordered a GE-425 information system equipped with direct access programming system (Daps) capabilities from GE. The system will be used in sales analysis, sales planning, payroll, accounts receivable and payable, and billing applications.

Ampex Corp. will supply an extended core memory to Philip Hankins Inc., Arlington, Mass., for on-line operation with an IBM 360/65 enabling them to offer their financial accounting service and terminal (Fax) program on a nationwide basis.

The Defense Supply Agency, Alexandria, Va., has installed a standard automated material management system at the Defense Construction Supply Center, Columbus, Ohio. The system is designed to mechanically perform material management functions.

Stuckey Stores, Eastman, Ga., a firm that manufactures and distributes pecan candy, has leased a Burroughs B2500 system for retail accounting functions such as accounts payable, general ledger, balance sheet, and management reports operations. It was previously inaccurately reported that the system had been purchased.

OPERATE IN REAL TIME

If you're an executive in the \$12 billion computer industry, can you afford to wait a month or even a week for vital news that could help you to make an important decision or a quick move resulting in a major contract? The burgeoning EDP field is perhaps the most competitive in all of industry, with hundreds of new firms springing up weekly. Coming in second is coming in last!

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Schedule of Technical Briefings

MINNEAPOLIS
December 4

MILWAUKEE
December 2

PITTSBURGH
December 11

ST. LOUIS
January 6

CINCINNATI
December 3

ATLANTA
January 8

BRANDON APPLIED SYSTEMS, INC.
1700 Broadway, New York, N.Y. 10019

Time-Sharing's Capacity Grows; Extends Service Outside D.C.

WASHINGTON, D.C. — U.S. Time-Sharing Inc. has announced the establishment of full-service offices in Pittsburgh, Pa., and Baltimore, as well as new branch offices in Silver Spring, Md., and Washington, D.C.

A company spokesman said that two important factors underlie the decision to extend the company's time-sharing and other computer services outside the Washington metropolitan area.

First, U.S. Time-Sharing's computer capacity has been increased five-fold, principally by the completion of an IBM 360/50/65 installation at corporate headquarters in Reston, Va.

Second, the company's recently announced Share OS/360 computer system, a proprietary development of U.S. Time-Sharing, is suited to the needs of large industrial firms in Pittsburgh and Baltimore.

The Pittsburgh office is headed by John Martini and Jack McDowell, senior marketing representatives. Baltimore sales manager is Jim Wester, while the new Silver Spring and Washington offices operate under the direction of sales manager Charles Post.

CompuComp Opens New Graphics Center

NEW YORK — CompuComp Corp. has established a computerized graphics center at Five W. 26th St. here, offering computerized typesetting/composition services.

Specializing in full page composition of directories and professional reference publications, the new facility is equipped with an RCA VideoComp, interfaced with an IBM 360/40 computer, as well as a variety of computer input and peripheral devices. The service will feature a newly developed proprietary universal composition language, said to permit economical computer typesetting of college level textbooks, complete lists, subheads, footnotes, bibliographies, and other relevant material heretofore thought to be economically unfeasible.

According to a company spokesman, the company will also computerize the generation of original data, from proprietary sources, in the compilation and updating of directories where appropriate. Through its wholly owned subsidiary, The Guinn Co., a complete graphic arts service will also be provided.

The new facility has already processed directories and professional reference books, as well as law indexes.

Other Expansions

Key Punch & Allied Services has opened a new facility in Bryan Industrial Park, Anaheim, Calif. The 18,000-sq-ft structure is designed to provide maximum efficiency in processing computer data 24 hours a day. Additional facilities include a total programming service, with 24-hour availability of trained operators and a Univac 9200 II.

Expansions

World Research Corp., parent company for Checkmate Publishing Co., Ariya Industries Ltd., and Meet-A-Match International, has added new facilities. The executive offices will be located at the North American Bldg., 36 S. State Street, Chicago. The company is a service organization in computer applications, management and engineering.

Programming Sciences Corp., software development and systems programming firm, has opened an office in the greater Boston area to serve as its center of operations in New England. The new office is located at 209 W. Central St., Natick, Mass.

Computer Personnel Consultants, Inc. of Chicago has opened a branch in Milwaukee, Wis., at 811 E. Wisconsin Ave. CPC is a specialist personnel firm serving the computer industry with placement, executive research, recruitment consulting, and various other related functions.

(Continued on Page 43)

Computer and Time Share Users

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Acquisitions

Remote Computing Corp., Los Angeles, has acquired Des-Comp III, a company that performs all types of arithmetic computations; stores values for later recall and use in computations; and computes the values of complicated trigonometric, exponential, logarithmic, random, or other user-defined functions. Remote Computing offers a

complete range of computer-utility services including time-sharing, remote batch, and on-site processing.

Computerology, Inc., Mt. Kisco, N.Y., a company that renders on-line and off-line computer services, has acquired Action Press, Inc. through an exchange of stock. The exact terms of the transaction were not dis-

closed. Action Press, with headquarters in Chippewa Falls, Wis., is a specialized franchise business operating under the name of "Shopping Guides of America."

KPA Nuclear, Inc., Pittsburgh, a nuclear engineering firm, has completed the purchase of Inca Engineering Corp., San Gabriel, Calif. Terms of the stock transaction were not disclosed. Inca, an engineering organization, performs sophisticated design and structural analysis utilizing large-scale computer programs.

Datadial, Inc., Smithtown, N.Y., has purchased 51% of the stock of Associated Computer Management, Inc. of Rego Park, N.Y., a company that markets special programs developed for medical centers utilizing electronic data processing. Datadial is primarily engaged in facilities management for general insurance agencies that permits immediate access to its time-sharing data processing facilities.

Pulsar Computing, Inc. of San Francisco and Fullerton, Calif., has announced the acquisition of Turner, Brown and Associates of San Francisco. Pulsar deals primarily in computer software and systems development.

Data 100 Corp., Minneapolis, has announced an agreement in principle for the acquisition of all of the assets of Rodale Elec-

tronics, Inc. of Garden City and Westbury, N.Y., in exchange for Data 100 common stock. The terms of the preliminary agreement involve a basic exchange ratio of sixty-three one hundredths shares of Data 100 common stock for one share of Rodale Electronics common stock. Data 100 is a designer and manufacturer of computer terminal equipment and systems, which provide computer users with the capability of transferring information between centralized computer centers and remotely located offices and plants. Rodale Electronics manufactures electronic equipment for military and commercial use.

E.P.G. Computer Services, Inc., New York, a data processing consulting firm, has reached an agreement in principle for the acquisition of Prudential Travel, Inc.

American Automation Training Centers, Inc., Kansas City, Mo., has agreed in principle to acquire National Institute of Meat Packing, Inc., Mundelein, Ill., for an undisclosed price. AATC, Inc. offers a combination correspondence-resident training course in introduction to computer programming and the operation of related unit-record equipment and keypunch.

Consolidation of Assoc-

metrics Inc. of Dallas, and Computer Utilization Inc. of Austin, Texas, has been approved by the boards of directors of both companies. Under the consolidation a new corporation will be formed to be called Computer Utilization-Associometrics Inc. Both companies will operate as separate divisions after the consolidation. Associometrics develops software packages for the legal profession, real estate business, and a number of general purpose data management and control systems. Computer Utilization is a management and computer consulting firm.

Brandon Applied Systems, Inc., New York, has announced that negotiations for the acquisition of Sharp & Oughton, Inc. and its affiliated companies have been terminated.

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EDP Industry Report, "the gray sheet", is generally regarded as the most authoritative source of market facts and figures on the \$12 billion-a-year computer industry. Its twice-a-month issues provide subscribers with facts, ideas, and insights on the computer market. Its well-researched contents have enabled it to become one of the most-quoted publications in the EDP field. EDP/IR is published 24 times a year by the International Data Corporation, the largest market data gathering, analysis, and publishing company in the computer and information processing industry. Subscriptions \$75 per year. Free copy of Annual Review and Forecast issue sent with pre-paid subscriptions. Write:

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Expansions

(Continued from Page 41)

Diversified Numeric Applications of Minneapolis has announced that work has been completed on a project doubling the area of the firm's production facilities. DMA is located at 9801 Logan Ave. South. It manufactures computer based automated clinical laboratory systems for use in hospitals and (medical) clinical laboratories.

Resource Computer Corp., Los Angeles, has announced the creation of a new office in Waltham, Mass., located at 520 Main Street. The company is a computer recruitment firm with interests in marketing, training, and management consulting.

World Computer Corp. of Dallas has more than quadrupled the size of its manufacturing facilities with the lease of a building located at 1710 Hill-Line Drive. The facility will be used principally to assemble the newly developed electronic payroll information collection system, now being marketed by WCC. Corporate offices will remain at 1615 Stemmons Freeway.

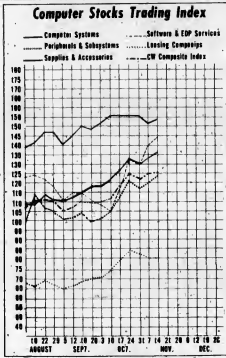
Computer Publications, Inc., a financial advisory service on the computer and high-technology industries, has moved its corporate headquarters to Newport Beech, Calif. The address is 500 Newport Center Drive.

Fordax Corp. has opened a computer center in Wellesley Hills, Mass. The center houses

two Fordax systems that will be used to support customers in the greater Boston area, and is located at 40 Washington Street. Fordax provides specially designed computer hardware and software systems for metal working.

graphic arts, paperboard, brokerage, and small business applications.

Scanforms, Inc. has announced the opening of a new manufacturing end printing plant in Bristol, Pa.



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COMPUTER STOCKS: TRADING SUMMARY

WEEK ENDING NOVEMBER 14, 1969

COMPUTER SYSTEMS			WEEK	WEEK
EXCH	CLOSING	PRICE	NET	NET
			CHANGE	CHANGE
N 147-129	158 3/8	BURROUGHS CORP.	+ 1/4	-1.17
N 49-38	55 1/2	COLLINS RADIO	+ 2	1.52
N 159-113	114 5/8	CONTROL DATA CORP.	+ 6 3/4	-5.56
A 56-54	98 1/4	DIGITAL EQUIPMENT	+ 3 3/4	-5.56
N 85-12	16 3/4	ELECTRONIC ASSOC.	- 1/4	-6.54
N 168-67	83 1/2	GENIE	+ 1/2	-1.50
N 114-15	184 1/2	HEWLETT-PACKARD CO.	+ 8 1/4	-1.30
N 160-107	143 1/4	IRVING-CLOUD	+ 1	-2.40
N 348-291	363	RAYTHEON INC.	+ 2 1/2	.49
N 157-188	144 1/2	ROK	- 1	-2.81
N 86-35	46 3/4	SPAC	+ 1/8	-3.11
N 38-38	37 3/4	RAYTHEON CO.	+ 2 1/2	-1.20
O 42-17	14 1/2	SCI. CONTROL CORP.	+ 2	-14.88
N 55-36	45 1/8	SPERRY RAND	+ 3 3/4	-1.63
A 58-56	48 3/4	SYSTEMS ENG. LABS.	+ 3 3/4	-8.30

PERIPHERALS & SUBSYSTEMS			WEEK	WEEK
EXCH	CLOSING	PRICE	NET	NET
			CHANGE	CHANGE
N 85-59	11 5/8	ADORESCORAPH-INT.	+ 5/8	-3.54
O 71-13	17 1/2	ALPHAMERIC	- 1	-5.54
N 49-38	44 1/8	AMPES CORP.	+ 1 5/8	-2.58
O 19-19	15 1/4	BOLT-BERNEKY A NEW	- 1/8	-3.17
N 17-9	9 1/2	BUNN-BAIRD	- 1/8	-3.58
A 37-18	88 7/8	CALCOMP	+ 3/4	-14.13
O 38-14	11 1/4	COMINTECH	+ 3/4	-4.17
A 16-17	11 1/8	COMPUTER EQUIPMENT	+ 2/8	-3.26
O 27-19	19 1/2	DATA PRODUCTS CORP.	+ 1	9.29
O 29-13	16 1/2	ELECTRONICS	+ 1/4	-1.54
N 45-48	15 1/2	ELECTRONIC REMOTE	+ 6 3/4	-5.78
N 23-43	75 1/8	ELECTRONIC M & M	+ 5 1/8	-1.55
O 18-7	7/8	FABRI-TEC	- 1/8	-5.97
O 21-13	17 1/2	FARMINGTON INFO	+ 1	-5.45
O 21-19	18 1/2	INFORMATION OIS	- 1	-5.13
O 11-17	5 1/4	HILCO ELECTRONICS	+ 1/4	-2.71
A 18-59	74 1/8	MONARK DATA SCI.	+ 3 1/2	-4.74
O 18-40	40	OPTICAL SCANNING	+ 1	-5.45
O 21-18	83 7/8	PHOTON	+ 1/8	-5.53
A 66-23	23	POTTER	+ 1/8	-5.53
O 74-54	54	RECOGNITION EQUIP.	- 1/8	-2.71
N 61-28	98 3/8	SANDERS ASSOCIATES	+ 1 1/8	-4.89
O 85-28	34	SCAM DATA	+ 2	-3.83
O 36-16	85	TALLY CORP.	- 1	-4.35
N 115-85	184 3/4	TERSO CORP.	+ 8 1/2	-8.44

SUPPLIES & ACCESSORIES			WEEK	WEEK
EXCH	CLOSING	PRICE	NET	NET
			CHANGE	CHANGE
O 47-31	38 1/2	ACME VISIBLE	+ 2	-5.48
N 22-11	16 5/8	ADAMS-MILLIS CORP.	+ 1/4	-9.48
O 27-23	25 3/4	BALTIMORE BUS FORM	+ 1/4	-9.48
A 59-17	24 3/2	BARRY MIGHT	- 7/8	-5.47
O 44-26	35 1/2	DATA DOCUMENTS	+ 1 1/4	-2.45
A 42-28	38 1/4	EMIS BUS FORMS	+ 5/8	-1.51
N 167-65	157	GENIE	+ 1/2	-1.50
N 118-94	117 1/2	3M COMPANY	+ 5/8	-8.86
O 37-29	34 1/2	MOORE BUS FORMS	+ 3 1/2	-1.50
N 49-36	44 1/2	NASDAQ CORP.	+ 1 1/8	-5.28
N 49-36	44 1/2	REYNOLDS & REYNOLDS	+ 1 1/8	-5.28
O 31-23	87 3/4	STANDARD REGISTER	+ 1 1/2	-5.71
N 34-25	34 1/2	UNACOL	+ 1/8	-1.47
O 80-18	18	WABASH MATHEMATICS	+ 1/8	-4.47
O 37-28	36 1/2	WALLACE BUS FORMS	+ 3/4	-2.81

SOFTWARE & ERP SERVICES			WEEK	WEEK
EXCH	CLOSING	PRICE	NET	NET
			CHANGE	CHANGE
A 30-19	99 3/8	APPLIED DATA RES.	+ 1 1/4	-5.29
J 14-5	4 1/4	ADVANCED COMP TECH	- 1/2	-2.41
A 19-4	29 1/2	APPLIED DATA RES.	+ 5 1/8	-4.37
O 19-6	9 1/2	ANITS	+ 3/4	-5.64
A 128-63	113 1/2	AUTOMATIC DATA PRG.	+ 5 1/4	-4.25
O 15-14	14	AUTO SERVICES	+ 3/4	-5.64
O 17-1	11 1/2	BRANDON APPL. SFS	+ 4 1/4	-5.67
A 21-9	9 1/2	COMPUTER APPL.	- 2	-13.79
O 16-4	4 1/2	COMPUTER NETWORK	+ 2 3/4	-5.45
O 42-18	18 1/2	COMPUTER NETWORK	+ 1/2	-5.45
N 34-10	31 1/4	COMPUTER SCIENCES	+ 1 1/4	-4.21
O 48-8	14 3/4	COMPUTER SFS	+ 1 1/4	-5.45
A 29-37	47 3/4	COMPUTING & SOFT	+ 2 3/4	-4.87
O 24-4	5 1/4	ORGANIZATION SERVICE	+ 1 1/2	-5.45
O 17-6	6 1/2	DATABAT	+ 1/8	-6.57
O 17-6	6 1/2	DATABAT	+ 1/8	-6.57
A 39-3	11 1/2	ELPCI COMP PROG	- 2	-10.81
N 38-19	19	ENTRAIDS	+ 1 1/2	-13.79
O 19-1	0	MATRIX CORP.	- 1/8	-5.56
O 22-3	3 1/4	NET COMP ANALYSIS	- 1/4	-13.79
O 27-23	25 3/4	PLANNING RESOURCES	+ 3 1/2	-5.45
A 11-4	5 1/4	PROGRAMMING & DIS	+ 1 1/4	-4.55
O 18-3	4 1/4	ROTHMAN SYSTEMS	+ 1 1/4	-4.55
O 37-23	3 3/4	STRATEGIC SYS	- 1/4	-4.24
O 36-11	18 3/4	THE COMP. INST.	+ 2	-10.47
O 12-3	3	UNITED DATA CENTER	+ 5 1/2	-14.29
N 111-4	181 5/8	UNIVERSITY COMP.	+ 7 1/8	-1.54
A 38-29	29 1/2	URS SYSTEMS	+ 2	-1.07
O 12-7	7 1/4	U.S. TIME-SHARING	+ 1/4	-5.45

LEASING COMPANIES			WEEK	WEEK
EXCH	CLOSING	PRICE	NET	NET
			CHANGE	CHANGE
O 14-4	8 1/4	8ANISTER CONTIN	+ 1/4	-2.58
O 45-24	29	RODINE COMPUTER	+ 3 1/2	-15.73
O 18-4	11 3/4	TELECOM RESOURCE	+ 1 1/2	-14.63
A 34-18	18 5/8	COMPUTER LEASING	+ 1 1/2	-8.74
O 13-12	12	CELESTRONICS	+ 1/2	-5.02
O 48-73	38 1/2	DATA PROG. P & G	+ 5/8	-1.40
O 16-5	8	BATHONIC RENTAL	- 1/2	-5.88
A 50-24	24 3/4	DEANBORN COMPUTER	+ 1 1/8	-5.98
A 16-8	11 1/2	ORCA, INC.	+ 7/8	-7.37
O 45-16	16 5/8	GRANITE-NET	+ 2 1/2	-5.37
A 26-19	18 5/8	GREYHOUND COMPUTER	+ 1 1/8	-7.24
N 54-29	27 1/2	LEASO DATA PROG.	+ 1 1/8	-5.98
O 9-4	5 1/8	LECTRO COMP LEAS	+ 1/8	-8.17
A 51-23	24 1/2	LEVINS-THOMPSON CO.	+ 1 1/8	-8.97
O 8-3	7 1/2	LUC DATA, INC.	+ 1/8	-19.23
O 14-2	3 5/8	MANAGEMENT ASSIST	+ 1/8	-3.57
O 10-4	4 1/2	HCC LEASING	+ 1/8	-11.79
A 34-5	8 1/4	SYSTEM CAPITAL	---	---
A 28-13	19 5/8	U.S. LEASING	+ 3/4	-3.92

Position Announcements

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Earnings Reports

AUTOMATIC DATA PROCESSING

Three Months Ended Sept. 30

1969 1968

Shr E/rd \$37 \$29

Revenue 7,371,704 5,609,448

Earnings 850,389 489,925

a-Related to include companies acquired in pooling-of-interests transactions.

AUTOMATION SCIENCES INC.

Year Ended July 31

1969 1968

Shr E/rd \$29 \$18

Revenue 2,351,312 1,727,201

Spec Crd 21,728

Earnings 209,401 197,219

a-Based on income before special credit; b-Equal to 20 cents a share.

BRANSON APPLIED SYSTEMS

Six Months Ended August 31

1969 1968

Shr E/rd \$8.04 \$8.11

Revenue 1,231,608 1,030,213

Tax Crd 20,000

Earnings 187,339 (19,611)

a-Based on income before tax credit and on common and common equivalent shares; b-Equal to 6 cents a share.

BUNKER-RAMO CORP.

Three Months Ended Sept. 30

1969 1966

Shr E/rd \$14 \$9

Revenue 62,283,987 64,024,989

Tax Crd 1,500,000 1,412,997

Earnings 4,496,925 3,430,559

9 Mo Shr \$1 \$2

Revenue 191,547,512 180,019,706

Tax Crd 2,634,500 2,382,214

Earnings 13,109,334 6,656,629

a-Based on income before tax credit; b-Equal to 19 cents a share in the quarter and 55 cents a share in the nine months, compared with 15 cents and 38 cents, respectively, in the like periods of 1966.

COGNITRONICS CORP.

Three Months Ended Sept. 30

1969 1966

Revenue \$715,495 332,267

Loss 169,645 36,823

9 Mo Rev 2,197,873 961,478

Loss 404,230 107,817

b-Includes results of operations of Stamford Tool & Die-Customatic division, acquired on Oct. 4, 1966.

COMPUTER INSTRUMENTS CORP.

12 Weeks Ended Oct. 3

1969 1966

Revenue \$1,434,089 \$1,551,824

Earnings 8,090 73,528

40 wk Rev 5,349,042 5,809,247

Earnings (168,270) 225,802

CONTROL DATA CORP.

Three Months Ended Sept. 30

1969 1968

Shr E/rd \$63 \$71

Revenue 137,149,000 107,048,000

Earnings 12,247,000 10,958,000

9 Mo Shr \$2.58 \$ 2.23

Revenue 410,498,000 341,809,000

Spec Crd \$3,499,000

Earnings 142,731,000 32,741,000

a-Related to reflect acquisitions on a pooling-of-interests basis; b-Based on common stock and common stock equivalents; c-Based on income before special credit; d-Gain from sale of certain manufacturing subsidiaries of Commercial Credit Corp.; f-Equal to \$2.90 a share; g-Includes net income of Commercial Credit Corp. amounting to \$7,628,000 in the quarter and \$23,209,000 in the nine months, compared with \$6,765,000 and \$18,748,000, respectively, in the like 1968 periods.

DIGITRONICS CORP.

Six Months Ended Sept. 30

1969 1968

Shr E/rd \$11 \$13

Revenue 9,244,507 7,690,066

Spec Crd 300,000 123,000

Earnings 626,731 440,414

a-Related by company; b-Based on income before special credit; c-Equal to 21 cents a share in 1969 and 17 cents a share in 1968.



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Earnings Reports

GATA PRODUCTS CORP.

Six Months Ended Sept. 27, 1969 1968 1968
bshr Erid \$11 \$15
Revenue 18,449,731 16,999,000
Earnings 459,000 612,022
e Earnings 6,282,848 6,109,648
e-Related by company to reflect the acquisition of Stearns, Inc., in May, 1969, on a pooling-of-interests basis.
e Based on income before special items; e-Credit; represents Federal income tax carryforward; e-Debit; represents mark down of securities to market value, less a tax-loss carryforward; e-Equal to 12 cents a share in 1969 and 13 cents a share in 1968.

ENNIS BRANSON COMPUTER

Six Months Ended August 31, 1969 1968 1968
Revenue 550,163
Loss 138,311
e-Related to 13 months operations of Ennis Higgins Computer Systems, Inc., acquired on July 31; b-Comparable figures not available.

FABRI-TEK INC.

Six Months Ended Sept. 26, 1969 1968 1968
bshr Erid \$24 \$22
Revenue 4,721,359 3,731,991
Earnings 129,254 59,296
6 Mo bshr
Revenue 9,271,021 7,923,413
Earnings 255,294 139,088

INFORMATION DISPLAYS INC.

Nine Months Ended Sept. 30, 1969 1968 1968
bshr Erid \$18 \$25
Revenue 1,717,470 1,072,897
Earnings 115,526 31,090
e-Primary earnings.

MTS SYSTEMS CORP.

Year Ended Sept. 30, 1969 1968 1968
bshr Erid \$137 \$81.02
Revenue 7,180,000 6,648,000
Earnings 397,000 289,000
3 Mo bshr
Revenue 1,948,000 1,810,000
Earnings 103,000 109,000
e-Related to: reflect two-for-one stock split in Nov., 1968.

UNIVERSITY COMPUTING CO.

Nine Months Ended Sept. 30, 1969 1968 1968
bshr Erid \$180 \$84
Revenue \$5,000,000 42,000,000
Earnings 10,810,000 4,820,000
e-Related to include acquisitions of a pooling-of-interest basis.

New Registrations

INFORMATION PROCESSING SYSTEMS, INC., 467 Syntex Ave., Woodland Hills, Calif. 91367, is a company that is a dealer and broker in computer hardware and software, computers and related equipment, filed to register 150,000 shares of common stock. Proceeds, at \$6 per share, intended for entering the business of marketing software products developed by software companies and users of data processing equipment, for expanding marketing activities for used computers, and other purposes. No underwriter is involved.

THE BOSTON COMPUTER GROUP, INC., 15 South St., Boston, Mass. 02108, a company that has seven subsidiaries engaged in computer software activities and that plans to utilize its existing nationwide network of computer software sales representatives, together with additional representatives, in the sale of used computer systems, filed to register 150,000 shares of common stock. Proceeds, at \$17.50 per share, intended to purchase an inventory of computer systems and components for the company's subsidiary, American Used Computer Corp., for that subsidiary's working capital; to fund its advertising and sales promotion; to purchase computer equipment, systems, design, and software for internal control of the company; and to provide for working capital. No underwriter is involved.

MARKET RESEARCH ANALYST

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ADVISOR SOFTWARE/HARDWARE \$10,500-\$12,000

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ADP Makes Major Changes In Top Executive Lineup

CLIFTON, N.J. — Automatic Data Processing, Inc. has made a number of executive changes. Henry Taub, who has been serving as president, was elected chairman of the board. He will be the company's chief executive officer.

Frank R. Lautenberg, presently executive vice-president of administration, was elevated to the post of president and will serve as the chief operating officer of the company.

Joseph Taub, executive vice-president in charge of opera-

tions, has decided to relinquish his present duties and will serve the company in a senior consulting and advisory capacity. He will continue on the board of directors as vice-chairman of the board.

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New Presidents Named For CIG & Subsidiary

LARCHMONT, N.Y. — Carl R. Freyer has been named president of Computer Investors Group, Inc., succeeding Bruce G. Williams. Prior to his appointment Freyer was executive vice-president and treasurer of the company. He continues as a director. Williams has been named president of Molecular Sciences, Inc., a new subsidiary formed by CIG to design and manufacture metal oxide semiconductor circuits. In addition, he continues as a director of Computer Investors Group.

Position Announcements

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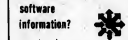
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